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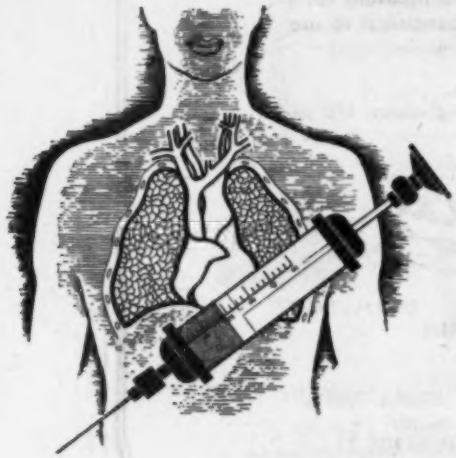

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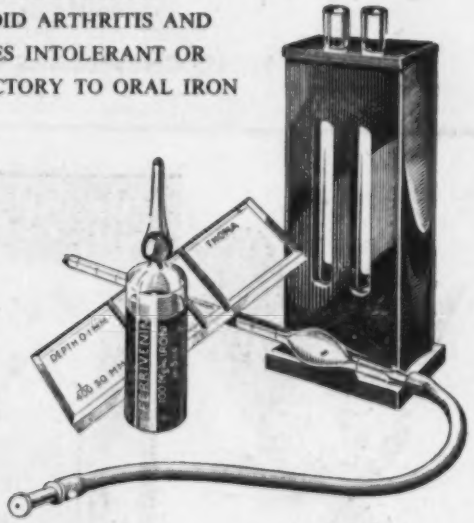

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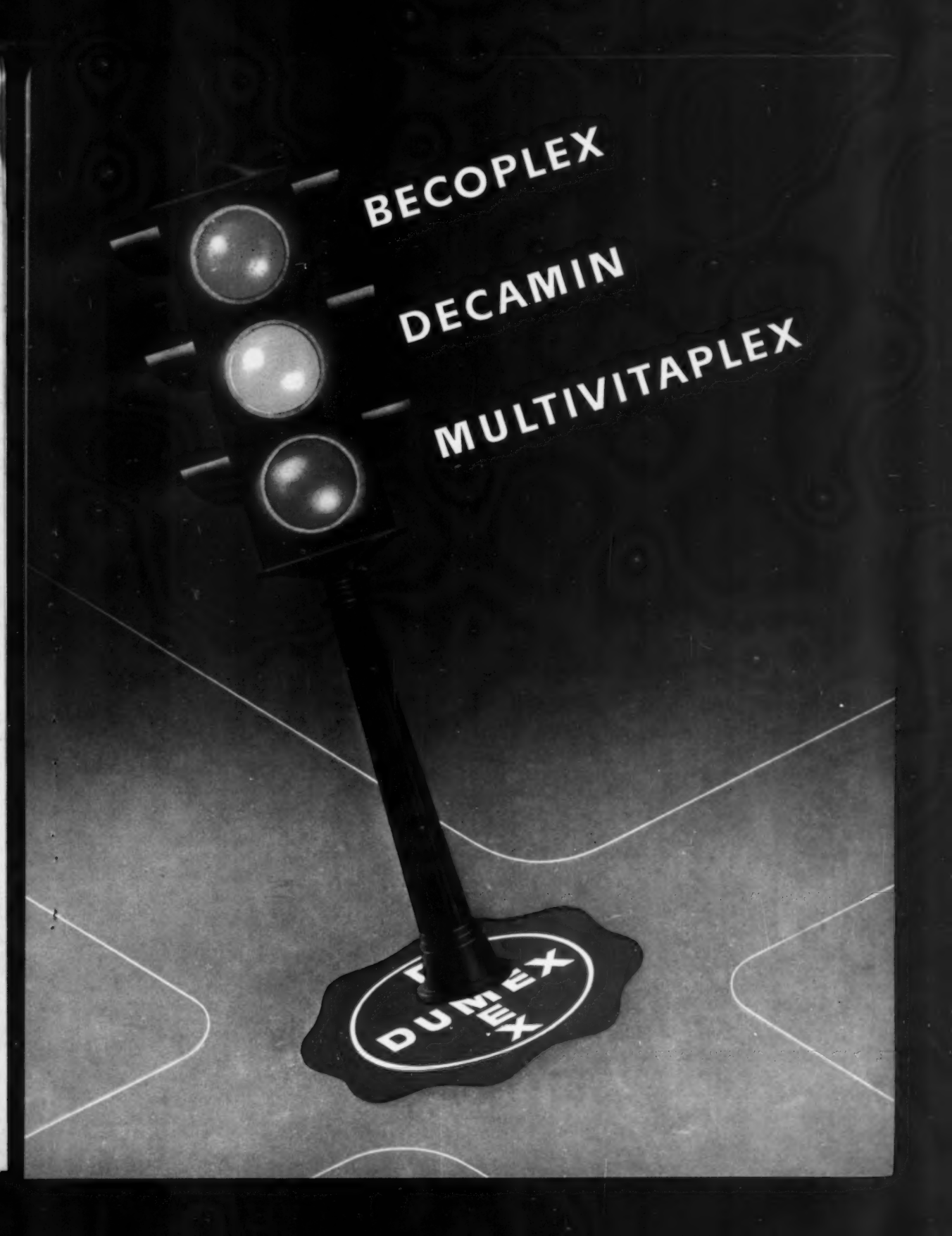
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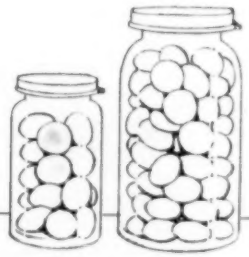

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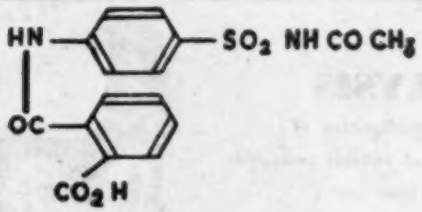

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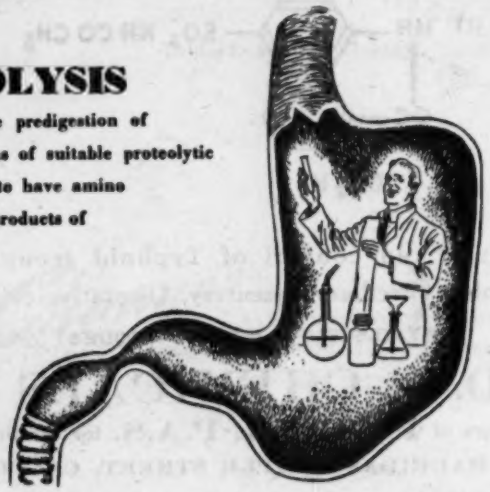

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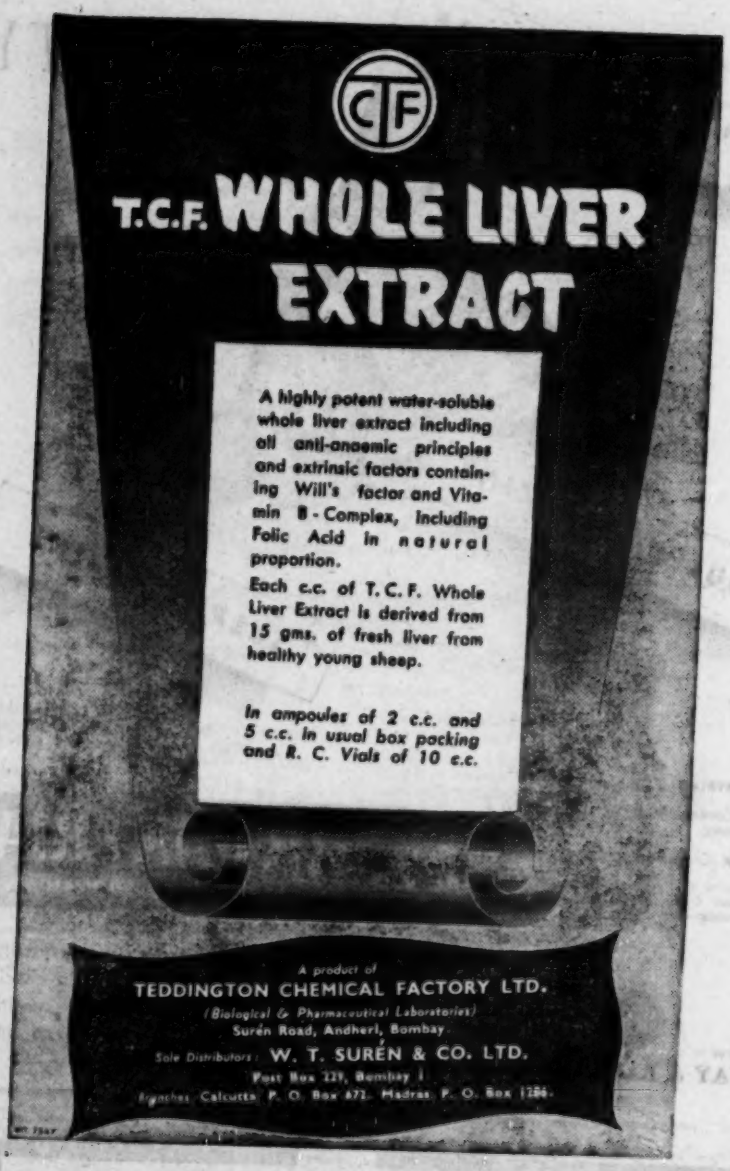
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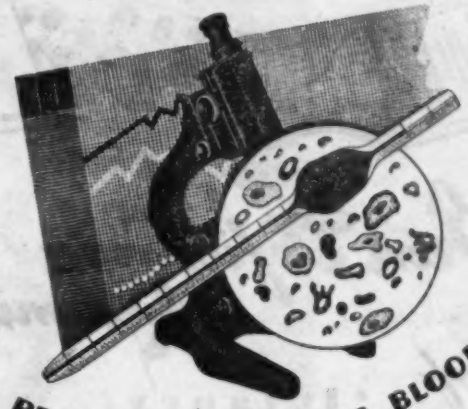

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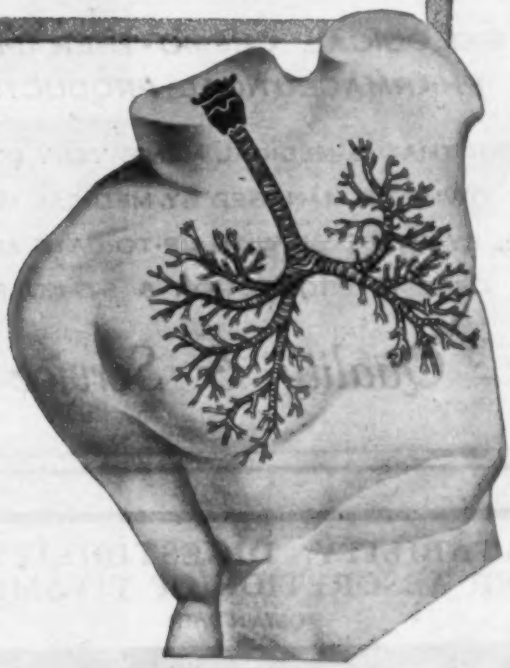

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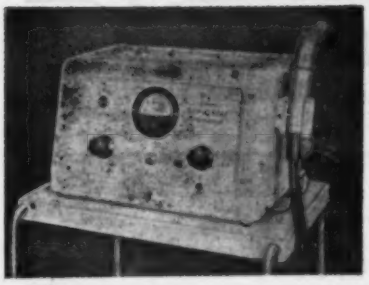

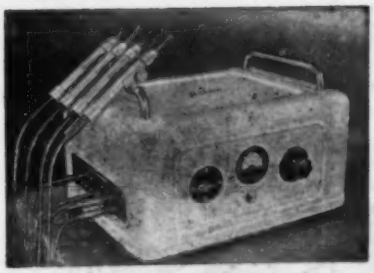

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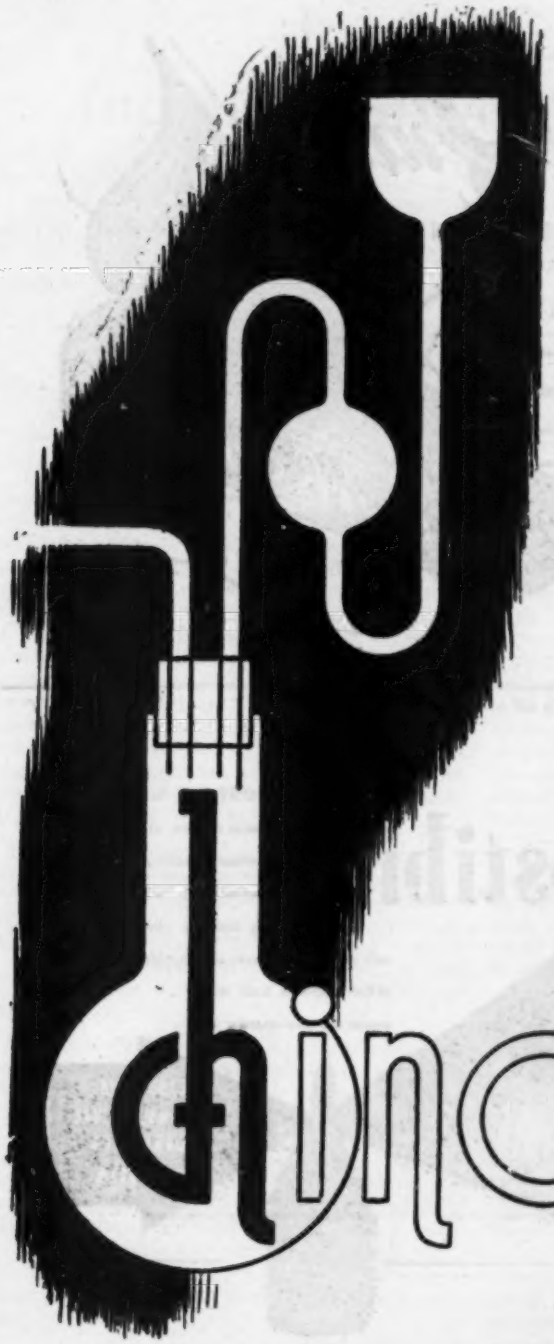

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ORIGINAL ARTICLES

TREATMENT OF ALLERGIC STATE WITH THE ANTI-HUMAN SERUM FLOCCULE

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Allergic reactions are now generally accepted to be excited by contact *in vivo* between an antigen and its specific antibody, the larger part of which antibody is fixed to the sensitive tissues of the allergic individual. As a corollary to this hypothesis, it would suggest itself that these reactions could be prevented (1) by physical alteration of the antigen or the antibody in such a way that the virulence of collision between them was minimised, or (2) by blocking the antibody in such a way that the antigen failed to contact it to excite allergic reactions. Perhaps the fewer horse serum reactions, obtained with pepsin-disintegrated horse serum proteins (Hutchison, 1939), could be attributed to such a physical alteration of the antigen caused by enzyme treatment (*Weil et al*, 1938), or to ' despeciation ' as Coghill *et al* (1940) named this process.

It must have occurred to many that if the antibody could be similarly altered physically, or at least could be blocked with some blocking substance, antigen-antibody conflict, and the resultant allergic reactions, could be avoided or minimised. This method of reducing incidence and intensity of allergic reactions does not, however, seem to have been investigated by any worker so far.

Of course, the difficulty of evolving a method of physical alteration of the antibody would need no emphasis. The antibody, by far the larger part of which remained fixed with the tissues, would hardly lend itself to artificial alterations. Nevertheless, some method of blocking it, wholly or partially, with a blocking substance, might be available. It would naturally be worth while to search for one of these blocking substances, chemical or immunological, and apply it for prevention and treatment of allergic state. I set out to investigate the possibility of producing a blocking substance by immunological method, and utilising it.

How would treatment of a horse with large doses of human plasma given at frequent intervals for a short period, alter its serum reaction producing character? A small scale experiment gave the answer. Out of four selected horses, which were ready for harvesting diphtheria antitoxin out of them, two were injected intravenously with 100 ml. of fresh pooled human plasma daily for 6 days. Seven days later the horses were bled. A small part of the blood was kept as such for separation of natural serum, while the rest was citrated for concentration of diphtheria antitoxin from the plasma.

A new test was designed to show the serum reaction producing property of these sera. Intracutaneous injection of 0·1 ml. of these sera into areas of forearm of sensitive individuals caused certain immediate reactions. These immediate reactions were, however, disregarded and they disappeared in a few hours. Five to ten days later delayed serum reactions appeared at and round about the sites of injection. These reactions were mostly patches of erythema, small discrete or confluent wheals, or a large local swelling. These delayed reactions which appeared round the sites of injection of untreated sera, and very rarely round the sites of injection of treated sera, helped to differentiate between one sample and another.

With the help of this test, indications were obtained about the change suggested to have taken place in the serum of the horses, which were treated with large doses of human plasma. The serum of the treated horses showed much less reaction than that of those which were not treated. While, however, the natural anti-human serum showed this property, the concentrated and purified antitoxin failed to show any difference. Thus, it was suggested that the natural serum of the treated horses contained some substance, which inhibited serum reactions, and that this substance was lost during ammonium sulphate fractionation of the serum proteins.

It was, however, essential to prove the safety of this anti-human serum before venturing into large scale trials. Several volunteers offered their co-operation for this safety test. They were injected with 10 ml. of the serum subcutaneously or intramuscularly for three consecutive days. During six months of close observation of these volunteers, no sign of illness did arise to cast doubt on the safety of the anti-human serum.

Encouraged by the safety, and the serum reaction reducing property, of the anti-human serum, further trials were taken up. Anti-human serum was prepared in horses, using a daily dose up to 500 ml. of the pooled human plasma given for 4 or 5 days. The natural serum from these horses, which were bled out 7 days later, was pooled and preserved by freeze-drying. Small quantities of this freeze-dried anti-human serum were incorporated with selected batches of therapeutic sera. The advantage of this incorporation of the anti-human serum with therapeutic sera has been shown clearly by the reduction in incidence of serum reactions obtained with the use of these mixtures, throughout the last five years.

However, determination of the optimum quantity of freeze-dried anti-human serum, which, when incorporated with therapeutic sera, would effectively reduce incidence and intensity of serum reactions, and yet be safely tolerated, had again to depend on co-operation of human volunteers. Neither a suitable *in vitro* test, nor an animal test, could replace the test in human volunteers. For this test, four different quantities of a very large pooled batch of freeze-dried anti-human serum, was mixed with a constant quantity of one of the therapeutic sera selected at random. These four mixtures were tested, two in each forearm, by the method described above. The smallest quantity of the freeze-dried serum, which showed the least reactions, was accepted as the optimum dose. This dose did never exceed 1 gm. per 100 ml. of therapeutic sera.

The reports, which have accumulated during these last five years, suggested very strongly that incorporation of the natural anti-human serum with therapeutic sera, succeeded in reducing incidence and severity of serum reactions. Quantitatively expressing, roughly about 20 per cent of the patients, treated with usual therapeutic sera, suffered from serum reactions. Side by side, less than 5 per cent of those, who were treated with therapeutic sera containing the optimum quantity of the anti-human serum, developed nothing more than mild serum rash.

Efforts of reproducing these results in animals have, so far, been unsuccessful. Anti-guinea-pig serum was produced in rabbits. The rabbit serum was toxic for guinea pigs. Hence, the antigen-antibody floccule was used instead. The floccule failed to offer uniform protection to guinea pigs sensitized with horse serum against the anaphylactic shock of intracardial injection of horse serum. Perhaps, the impact between the antigen and the antibody in the sensitized guinea pigs was so severe, that whatever mild blocking property the floccule might had, failed to influence the result.

Inspite of this failure, however, the success, which was obtained with the anti-human serum in inhibiting serum reactions, removed all hesitations about extending application of this method to the treatment of other allergic states of man.

Preparation of Anti-human Serum Floccule

Anti-human serum of these experiments was prepared in rabbits, chiefly for the sake of economy in the use of human plasma. In most cases, it was an auto-anti-human serum, because the patient's own plasma was used for immunization of the rabbits.

From the patient, about 300 ml. of blood was drawn out. The plasma was separated by centrifugation, distributed into small containers, and stored by freeze-drying. Whenever necessary for use, the required quantity of the freeze-dried plasma was reconstituted with sterile distilled water containing 10 mgm. per cent of phenyl mercuric nitrate.

Two young rabbits, weighing between 1 Kg. and 1·5 Kg., were taken for each patient. As large a volume of the reconstituted plasma as the rabbits could bear, was injected intravenously into these rabbits everyday. If the plasma was diluted up to thrice its original volume, and injections were given slowly, 20 ml. of the plasma could be administered without difficulty. Injections were continued for four days, or till all but the equivalent of about 30 ml. of the plasma had been injected into the rabbits. Out of this remaining (30 ml. of the) plasma, about 10 ml. was required to precipitate rabbit antibody, and the remaining volume for suspending the centrifuged floccule.

Seven days after the last injection, the rabbits were bled out. The serum was separated, preserved with 10 mgm. per cent phenyl mercuric nitrate, and sterilized by filtration. The optimum quantity of the human plasma, which was required to precipitate out the rabbit antibody completely, was determined. On the basis of this determination, the required volume of the reconstituted plasma was added to the whole of the rabbit serum under aseptic conditions.

The mixture of human plasma and rabbit serum was made in a sterile centrifuge bottle, which was later kept in the cold (4°C – 7°C), so that flocculation took place in the cold overnight, and not in the heat. The floccule was centrifuged and the supernatant decanted off aseptically. The separated floccule was later suspended with the reconstituted human plasma to make a total volume of about 25 ml. and was kept in a rubber stoppered bottle in a refrigerator.

Seven patients, suffering from different varieties of allergic state, were treated with this floccule. Short reports of these cases are given below.

Case Reports

Case 1—Male, 43, bacteriologist, suffered from violent sneezing fits every morning. Local application of vasoconstrictors gave temporary relief. The fits, however, reappeared in a worse form when he approached the animals which he had to handle very frequently. These allergic reactions almost made it impossible for him to do his work properly especially during certain seasons.

Auto-anti-human serum floccule was prepared against his own plasma, and treatment commenced as soon as the pre-

paration was complete. First day, 1 ml. of the floccule was injected subcutaneously. No reaction and no change of condition were noticed. On the two following days, 2 ml. doses were given. Local swelling and erythema developed after each injection. There was, however, no pain or discomfort associated with these local reactions. Subsequent doses of 2 ml. each were given every third day till the floccule was exhausted. Each of these injections developed slight local reactions.

The treatment effected significant changes in the allergic state of the patient. After the third dose, the sneezing became less frequent and less intense than before. Six doses made him feel comfortable even in the vicinity of animals and the patient developed a general sense of well being. Further injections pushed this improvement till the patient felt considerable relief from his suffering.

During the 2½ years since his treatment was complete, the patient has suffered from occasional attacks of common cold, but never from those fits of sneezing and dripping from the nose which used to make him feel miserable before the treatment.

Case 2—Female, 37, housewife, had a small patch of dry eczema on the back of her neck. However, she took no notice of it, till during the Christmas of 1950 she was out on a long motor trip through a warm, dry and dusty country. The eczema flared up, and soon generalised into allergic dermatitis, which spread throughout her body. Local applications of soothing lotions, and administrations of antihistaminic drugs gave her very little relief. She, therefore, submitted to the new treatment.

Her acute suffering, which demanded immediate treatment, did not permit the preparation of auto-anti-human serum. A batch of anti-human rabbit serum, which was prepared against pooled human plasma, was, however, available. This serum was flocculated with the patient's own plasma, and the floccule was suspended in the patient's own plasma.

The first dose of 1 ml. caused a general exacerbation of her symptoms. Nevertheless, the second dose of 2 ml. was given on the next day. It did not make her feel any worse. With the third injection of 3 ml., given on the following day, she began to feel improved. Subsequent injections of 2 ml. each were given daily till the floccule lasted.

Each of these injections gave her more and more relief. The generalised rash disappeared completely on the 5th day of treatment. Even the original eczematous patch was marked by nothing more than a lichenified area of the same size, at the end of the treatment. So far, her eczema has not shown any tendency to become worse or spread.

Case 3—Boy, 7, student, developed allergic urticaria throughout his body, one night during his antirabic treatment. He had yet to take four more injections to complete his antirabic course. His parents were, naturally, very anxious for something to be done to save their boy from this additional suffering. The boy was, therefore, sent to me for treatment.

This boy was treated with a floccule, in the preparation of which pooled human plasma, instead of the patient's own plasma, had been used both for immunization of rabbits and for preparation and suspension of floccule. One ml. of this floccule was injected subcutaneously shortly before administration of antirabic vaccine. That night too, the child developed urticaria, but it soon disappeared. Next day, the child was given 2 ml. of the floccule before antirabic vaccination. Since this injection, allergic rash entirely stopped developing.

Case 4—Male, 33, pharmacologist, had been suffering like the first patient from allergic rhinitis since a very long time. His nasal mucous membrane had been cauterized by a specialist several times. He was given courses of autohæmotherapy in addition. None of these treatments seemed, however, to have done him any good. So he agreed to give the new treatment a trial.

Auto-anti-human serum floccule was prepared as usual. The first three administrations of 2 ml. each were uneventful. The fourth injection, however, caused petechial hæmorrhages round the site of injection, but no pain or suffering. Alarmed at this reaction he was hesitating to take further injections. He was, however, prevailed upon to take two more doses of 1 ml. each on alternate days. These injections caused him no further reactions.

The treatment could not be completed, but even with this limited treatment he felt considerably improved. Up to date, that is more than 4 months after this treatment, he has remained free from those attacks of sneezing fits which used to trouble him before.

Case 5—Male, 32, bacteriological technician, had bilateral weeping eczema of his feet and ankles. Prescribed treatments for eczema gave him no relief. On the contrary, with lapse of time pustules appeared all over the eczematous area, and later these pustules broke to form open, oozing ulcers. Walking was painful for him at this stage. He accepted my suggestion of giving the floccule treatment a trial.

Bacteriological examination of the pustules failed to reveal presence of any pyogenic organism. Total leucocyte count was normal, but differential count showed an increase of eosinophils to 11 per cent.

Treatment was commenced with auto-anti-human serum floccule. He was given daily doses of 2 ml. each. Throughout these injections, however, he never showed the least reaction at the sites of injection. Nevertheless, his eczema showed signs of improvement, though only to a limited extent. The old ulcers healed, and fewer new pustules formed. Oozing diminished in quantity, and the affected areas changed their appearance. Diminution of pain made walking easier for him. There was, however, no further progress beyond this stage at the end of the treatment.

Continuation of the treatment was indicated by this lack of further progress. Auto-anti-human serum was, however, all exhausted. Hence, a batch of anti-human rabbit serum, which was prepared against pooled human plasma, was used instead. This serum as such, instead of the floccule, was injected right into the eczematous areas subcutaneously. Within a few minutes after injection of the first dose of 2 ml. into each feet, the eczematous areas began to swell. The swelling went on increasing, but did not extend beyond the eczematous areas. The tension of the swelling caused pain on walking. The patient, however, complained of no other trouble.

The swelling reduced itself gradually and disappeared entirely within 3 days, and along with it was gone by far the larger part of the eczema. The eosinophils, at this stage, showed a reduction from 11 per cent to 3 per cent. This local injection was repeated 5 times. Intensity of the reactions gradually diminished with the progress of treatment, and a proportional improvement of allergic state was notice-

able. The patch of the left leg disappeared entirely, while that of the right leg was reduced to a small area 1 cm.². At this stage, however, the treatment was discontinued as the patient went away on long leave.

Case 6—Male, 37, pharmacologist, used to suffer very frequently from excruciating headache, which was ascribed to sinusitis. He was given all the treatment for the condition, including punctures of sinuses, washing, drainage, and auto-hæmotherapy. Inspite of these treatments, his headache continued. He could hardly work owing to frequency and intensity of his headache. While he was wondering what to do about his headache, he fell an easy prey to my suggestion of giving the new treatment a trial.

His differential eosinophil count was as high as 19 per cent, and it was only this sign which encouraged me to take him up.

He was treated with his auto-anti-human serum floccule. The commencement of treatment, however, presented difficulty. The patient was known to be hypersensitive to animal serum proteins. It was, therefore, essential to be cautious at the early stage of treatment. Nothing untoward happened after the first injection of 1 ml. of the floccule. The second dose of 1 ml. was given 5 days later. Two days after this injection, serum rash appeared. The rash was controlled easily by administration of calcium salts. On the third day after appearance of this rash, the third dose of 1 ml. was given. Slight local reaction appeared immediately after this injection, but the reaction disappeared soon afterwards. From the next day onwards 1 ml. of the floccule was administered every day for 10 days. The patient complained of a feeling of lassitude developing after these injections. The later injections were, therefore, given twice a week, and these gave rise to nothing but slight local reaction of a few minutes duration.

His headache diminished appreciably since the day he developed generalised rash. Subsequent injections helped to maintain the progress, till at the later stages of the treatment he was completely free from headache. At this stage his eosinophils showed a drop from 19 per cent to 2 per cent. He looked well and fit, and the feeling of depression associated with his headache disappeared.

He has not complained of any more headache during the 4 months of follow up after completion of his treatment.

Case 7—Girl, 9, student, was bitten by a wasp. She was bitten by the same species of insect about a month back. Possibly, the first bite had sensitized her against the poison, and, hence, the second bite excited a mild anaphylactic shock. Within two minutes after the bite, she started vomiting, purging, and sweating profusely. The pulse became thin and slow. Immediate injection of 0·4 ml. of adrenalin chloride solution saved her from collapse, but a few minutes later her whole body was full of urticarial rash, inspite of the adrenalin which had been given less than half an hour earlier. It was thought worth while trying the effect of anti-human serum floccule in the treatment of this rash. Two ml. of the floccule, prepared against a common pool of human plasma, was administered intramuscularly. The rash disappeared entirely within half an hour after this injection.

Comment

All these results could not possibly be just a matter of chance. Of course, all these patients were quite healthy but for the allergic state from which they were suffering. The tissues affected by the allergy, evidently, did not develop permanent pathological changes. If such cases were selected for further trial of the anti-human serum floccule. these results should certainly repeat themselves. However, the safety of this method of treatment appeared to be beyond any reasonable doubt. The mild reactions caused by the floccule would on no account be considered to have endangered the safety of the patients.

Discussion

An attempt at explaining the mechanism must naturally be made. The presumption that the anti-human serum cured allergic states by blocking the anti-body has to be supported by logic.

The three reagents, which took part in the mechanism, were the antigen, the antibody, and the blocking substance. This blocking substance was itself of the nature of an antibody. To differentiate between these two antibodies, that of the patient's was named allergy-producing antibody while that of the anti-human serum was named blocking antibody. Of course, the therapeutically effective blocking antibody was only one of the many blocking antibodies present in the anti-human serum, each blocking antibody being specific against one of the proteins of human plasma. The allergy-producing antibody was naturally one of the proteins of human plasma. The therapeutically effective blocking antibody was specific only against that variety of human plasma protein which was the allergy-producing antibody.

To explain the genesis of the blocking antibody, it would require to be assumed that flooding of the tissues with enormous quantity of an antigen would stimulate production of an antibody functionally different from the usual. The usual antibody was formed chiefly with a view to destroying and eliminating the foreign antigen. Repeated, small scale stimuli were conducive to formation of this aggressive variety of antibody. If, however, overwhelming doses of this antigen were administered, the tissues would possibly rally in a different way. To meet the immediate needs of defence, the tissues would probably form a variety of antibody, which would strive to block the activity of the antigen, so that it did not harm the tissues. This non-aggressive, defensive antibody, whose activity would be directed only towards blocking the antigen, was supposed to be the active-principle of the anti-human serum.

This blocking antibody might, or might not, also form precipitates with the antigen—the human plasma protein. Those which were formed in horses did not flocculate with human plasma proteins, while those which were formed in rabbits did. Perhaps, in rabbits, two properties, (1) blocking the antigen activity, and (2) flocculation with the antigen, were impressed by the same antigen upon one and the same antibody. This view was quite compatible with the present day

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knowledge on plurality of antibody functions (Landsteiner, 1946).

Hence, both the natural anti-human horse serum and the anti-human rabbit serum floccule would contain the blocking antibody. In the preparation of the floccule, only the precipitating function of the antibody was possibly saturated by the antigen, leaving the blocking property free. The advantage of using the floccule was due to its purity and concentration of the blocking antibody.

The quantity of the blocking antibody, specific against the allergy-producing antibody, must naturally be very small in a given dose. How could such a small quantity of the blocking antibody effectively contact the allergy producing antibody?

It was difficult to explain. However, the fact was known that a small quantity of antigen frequently sufficed to provoke allergic reactions in a hypersensitive individual. Inspite of the possibility of very high dilution of the antigen by the circulating blood, and its neutralization by whatever small quantity of the antibody which might be present in circulation, the antigen could contact the fixed antibody to excite the reactions. Under similar circumstances, the small quantity of the blocking antibody in the anti-human serum floccule should also be able to contact the allergy producing antibody quite effectively. Perhaps, the means of such contact was different from those which we are generally familiar with.

The protection offered by the blocking antibody would naturally be short-lived like all passive immunity. Under its cover, however, allergic state could convert itself into immune state. During allergic state, the antigenic stimulus was spent up in exciting allergic reactions. If the allergy producing antibody were kept blocked for some days, the antigenic stimulus would be available for building up immunity. Given sufficient time for the antigenic stimulus to develop immunity, immune state could replace allergic state. Such a conversion seemed to have taken place in the patients treated with the anti-human serum floccule.

SUMMARY

Seven patients, who were suffering from uncomplicated allergic states and were otherwise quite healthy, were successfully treated with anti-human rabbit serum floccule.

The anti-human serum was prepared in rabbits by a short course of intravenous administration of very large and frequent doses of the patient's own blood plasma. The serum obtained from these rabbits was later flocculated with optimum proportion of the patient's plasma, and the centrifuged floccule was later suspended in the patient's plasma.

However, when immediate treatment was demanded in acute cases, it was not possible to prepare auto-anti-human serum. In such cases, the anti-human serum, which was prepared against pooled human plasma collected from a large number of donors, was used instead.

The patients felt improved even at the earlier stages of treatment. However, the treatment was continued to obtain lasting effects.

None of the patients showed bad symptoms, which would raise doubts about the safety of the anti-human serum.

The probable mechanism of action of the anti-human serum is discussed.

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A STUDY ON THE CIRCULATING BLOOD VOLUME UNDER ANAESTHESIA*

4. Inhalation Anæsthesia

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Changes in the blood volume incidental to surgical procedure are of concern to surgeons. Actual blood loss is a generally recognised factor, but it may not be the most important consideration in surgical procedure. In addition to blood loss the effect of anæsthesia upon respiration, arterial tension and capillary and venous tone must be considered because alterations in the vascular tone and anoxia, etc., may profoundly affect the circulating blood volume. Changes in the circulating blood volume brought about by other factors may influence the condition of the patient during and after operation to a greater extent than blood loss alone.

The changes in the blood produced by hæmorrhage have been studied in detail by many workers. But changes in the body fluid resulting from anæsthesia have received relatively little consideration.

Nitrous-oxide-oxygen-ether mixture is the commonest of all the anæsthetics used particularly in those countries where the introduction of the modern anæsthetic methods are very recent. The widespread use of this mixture demands a thorough understanding of its physiological action on the human system. This knowledge is valuable in the choice of anæsthetic agents specially in ill and debilitated patients and for prolonged anæsthesia. This is also a guide to the assessment of

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anæsthetic shock over and above the operative shock and, consequently, to the replacement therapy.

The results obtained so far by various workers are in close agreement. Generally, there is an increased concentration of cell volume and diminution of plasma volume during nitrous-oxide-oxygen-ether anæsthesia. Barbour and Bourne found a 10 per cent increase in blood concentration in dogs. Hamburger and Ewing found a 15 per cent rise in the hæmoglobin content and a 10 per cent rise in erythrocyte count in dogs anæsthetised with ether. In 23 dogs McAllister (1938) found a lowering of plasma volume after an hour of ether anæsthesia. The average decrease was 11 per cent with the range of 6·3 to 17·2 per cent and increase of red cell volume and protein concentration. This was confirmed by Bollman *et al* (1938). Akiawa (1934) using the carbon monoxide method observed decrease in total volume ranging from 5 to 39 per cent (average 20 per cent) in 42 out of 43 dogs subjected to various abdominal operations. Stewart and Rourke (1938) observed 16 cases under different operations after 70 to 160 minutes of ether anæsthesia and found that there was considerable reduction in the volume of blood without any appreciable change in its physical and chemical character. In some of the subjects the reduction of total blood volume was more than 20 per cent and average reduction in the series was 13 per cent. Gibson and Branch (1937) studied four patients during nitrous oxide, oxygen and ether anæsthesia. In every case the induction of anæsthesia was accompanied by a slight but definite decrease in plasma volume. Total cell mass was increased in one and slightly reduced in three. Ragan *et al* (1939) also confirmed the findings.

It is possible that certain anæsthetic agents will be more harmful in the condition of shock and in old and debilitated patients. In fact, Bazett and Krabbel (1940) were of the opinion that nitrous oxide was better tolerated in those cases than ether and chloroform. Bonnycastle (1942) suggested that ether would not be advisable in case of shock owing to the decrease in plasma volume.

In this series of experiments a co-ordinated study of the plasma volume, total cell mass, hæmoglobin and blood pressure was made and their inter-relation were noted.

Materials

Indoor patients undergoing surgical operations were selected for investigation. The premedication used was paraldehyde per rectum and 1/100 grain of atropine sulphate subcutaneously. The control blood volume was determined half to one hour after premedication and half to one hour before anæsthesia. The details of the technique of blood volume estimation by Evans blue method have already been published (Chatterjee, 1952a).

The anæsthesia administered was nitrous oxide, oxygen and ether mixture through semi-closed circuit.

A second estimation of blood volume was made during the course of anæsthesia at intervals of time varying from 15 to 110 minutes. Blood pressure and pulse were carefully recorded at 15 minute intervals during the operations.

The results of a control series have been already reported by Chatterjee (1952b) to establish the validity of the repeated determination of blood volume by Evans blue method.

In the present series of 73 cases no intravenous transfusion of fluid was necessary in any of the cases and blood loss during the operations was not appreciable.

The 73 cases constituting the series comprised of the following operations done under general anæsthesia; abdominal operations for gall bladder, appendix and stomach, repair of hernia, operations on the kidney and urinary bladder, and removal of benign tumour.

The relationship of the changes in plasma volume with the course of anæsthesia is graphically represented (Fig. 1) with the mean of the changes of

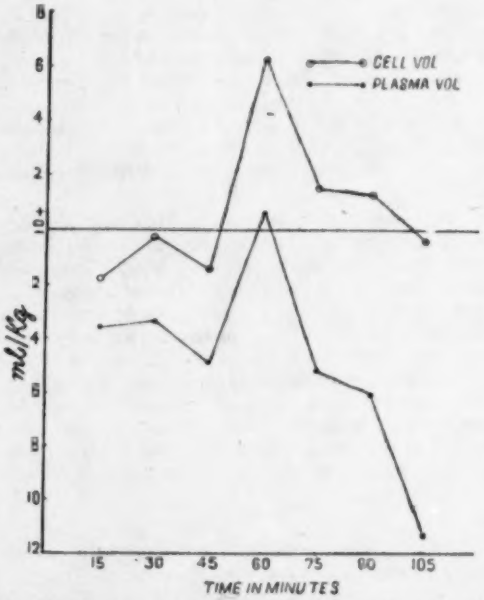

Fig. 1.—Showing the Relationship of the Changes in Plasma Volume with the Duration of Anæsthesia

plasma volume against the time in minutes. The curve can be divided mainly into three phases. In the first phase of initial depression from 15 minutes to 45 minutes the plasma volume shows a gradual reduction with the maximum of −4·94 ml. per Kg. at 45 minutes. In the second phase from 45 to 60 minutes the mean plasma volume exceeds the initial value by +0·6 ml. per Kg. In the third stage, beyond 60 minutes, the mean plasma volume shows a steady decline as the time proceeds. The total cell mass follows the trend of plasma volume,

i.e., there is an initial decrease at 15 minutes of anæsthesia which is corrected during the next 15 minutes. This is followed by a reduction at about 45 minutes. There is a sharp rise well above the initial value at 60 minutes followed by a steady decline with the progress of time touching to the initial level at about 105 minutes of anæsthesia.

For detailed analysis of plasma volume and total cell mass both the readings were classified into groups according to the duration of anæsthesia. There were as many as 19 groups ranging from 15 to 105 minutes (Tables 1 and 2). To examine the relation of the change in plasma volume and total cell mass with the duration of anæsthesia, a preliminary analysis of variance between the groups was done and the results are set out in Table 3.

TABLE 1—FREQUENCY TABLE OF PLASMA VOLUME BETWEEN TIME INTERVAL

	Time in Minutes																		
	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	TOTAL
−19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
−17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—
−15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—
−13	...	...	...	...	...	3	...	...	...	..	...	1	...	...	...	...	...	..	...	4
−11	...	...	1	..	1	2	...	...	...	...	...	...	...	1	...	...	...	1	...	6
−9	...	...	1	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	5
−7	...	2	...	2	2	1	...	...	1	1	...	...	...	1*	...	...	...	...	...	10
−5	4	...	2	..	1	1	1	...	...	...	...	...	1	...	...	...	..	...	...	10
−3	3	1	1	2	...	2	1	1	1	...	...	1	1	...	...	...	...	...	1	15
−1	1	2	1	1	...	1	2	...	...	1	...	1	...	...	...	1	...	...	...	11
+1	...	...	...	...	1	1	...	1	...	2	...	...	...	...	...	...	...	...	...	5
+3	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—
+5	...	...	...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	3
+7	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
+9	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Total	8	5	7	9	6	13	4	2	3	5	0	3	2	2	0	1	0	1	2	

TABLE 2—FREQUENCY TABLE OF TOTAL CELL MASS BETWEEN TIME INTERVAL

	Time in Minutes																		
	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	TOTAL
−15	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2
−13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—
−11	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2
−9	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	1	4
−7	1	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3
−5	...	2	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	5
−3	...	1	...	...	...	2	1	...	...	...	...	...	...	1	...	...	...	...	...	5
−1	2	1	1	3	...	...	1	...	...	2	...	1	1	1	...	...	...	...	...	13
+1	3	...	1	2	2	2	...	...	...	...	...	2	...	...	...	...	...	...	...	12
+3	...	...	1	1	1	1	1	...	...	1	...	...	...	...	...	...	...	1	...	7
+5	1	1	...	1	1	1	...	...	...	1	...	...	1	...	...	...	...	...	1	8
+7	...	...	1	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	5
+9	...	...	...	...	...	...	...	1	2	1	...	...	...	...	...	1	...	...	...	5
+11	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	2
Total	8	5	7	9	6	13	4	2	3	5	0	3	2	2	0	1	0	1	2	

TABLE 3—ANALYSIS OF VARIANCE TABLE

	Source of variance	*Sum of sqs.*	*Mean of sqs.*	*F.*	*Remarks*
Plasma Volume	1. Between groups	535·62	29·76	1·035	Not significant
	2. Within ,,	1551·72	28·74		
Total Cell Mass	1. Between groups	794·47	44·14	1·389	Not significant
	2. Within ,,	1716·21	31·78		

The variation between groups was found not significant in both cases. In the light of the above analysis the difference in the mean change between groups is statistically insignificant. This shows that there is no progressive change of plasma volume and total cell mass in an unselected series with the duration of anæsthesia.

In both the cases the group being found not significant, the result of 73 observations were pooled and 't' test was carried on the entire observations. The result is given in Table 4.

TABLE 4.—RESULT OF "T" TEST

Character	*Mean change*	*Sd. Error*	*"t"*	*Degree of freedom*	*Remarks*
Plasma Volume ...	−4·151	0·630	6·589	72	Highly significant
Total Cell Mass ...	+0·178	0·681	0·261	72	Highly significant

TABLE 5

	LOWER GROUP			HIGHER GROUP			TOTAL OF GROUPS		
Time in minute	*No of cases*	*Total decrease in plasma volume*	*Mean*	*No of cases*	*Total decrease in plasma volume*	*Mean*	*No of cases*	*Total decrease in plasma volume*	*Mean*
0-30	9	−6·12	−0·68	20	−91·333	−4·56	29	−97·453	−3·32
30-60	10	+11·563	+1·15	23	−143·41	−6·23	33	−131·847	−4·00
Above 60	4	−7·79	−1·94	7	−70·30	−10·04	11	−78·09	−7·10
Total	23	−2·347	−0·102	50	−305·043	−6·101			

TABLE 6—ANALYSIS OF VARIANCE TABLE

Source of variation	*Sum of sqs.*	*Degree of freedom*	*Mean of sqs.*	*F.*	*Remarks*
Initial plasma volume ...	589·20935	1	589·20935	30·484	Highly significant
Time ...	136·57576	2	68·28788	3·533	Significant
Interaction (Time × initial plasma volume)	52·15424	2	26·07712	1·349	Not significant
Error	1295·00586	67			

TABLE 7

Character	*Co-efficient of correlation(r).*	*Sd. Error*	*Degree of freedom*	*"t"*	*Remarks*
Hæmoglobin	−0·04	0·109	67	0·376	Not significant
Blood pressure					
Systolic	−0·0003	0·188	28	0·001	,,
Diastolic	+0·225	0·177	28	1·27	,,

The significance of the mean change in plasma volume indicates that there is a significant drop of plasma volume under anæsthesia. The total cell mass presents a different picture altogether. There is a mean rise of the value (+0.178) though it is found statistically not significant.

Further analysis was done introducing the amount of plasma volume initially present before the experiment as a factor. This was done only with three time groups 0—30 minutes, 30—60 minutes and beyond 60 minutes after sorting them into two classes higher and lower in respect to the amount of plasma present initially. The

result of the analysis of variances is given in Table 5.

It would be interesting to note that elimination of the variation due to initial plasma volume makes the time a significant factor in effecting the change in plasma volume under anæsthesia. The lower initial plasma volume group recorded a mean change of −0·102 and the higher one of −6·101. The difference is also found significant showing that the more the plasma volume initially present the greater is the fall, a finding which needs further investigation.

The interrelation between the plasma volume of the whole series and hæmoglobin (gm. per 100 ml.), systolic and diastolic blood pressure are shown

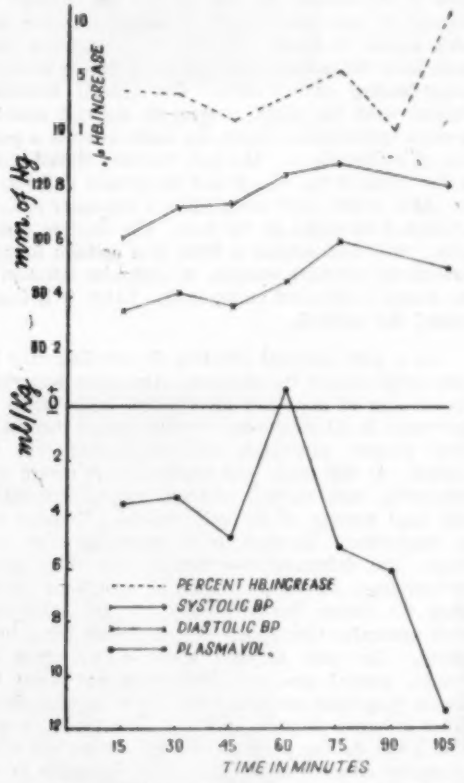

FIG. 2—SHOWING THE INTER-RELATION BETWEEN THE PLASMA VOLUME, HÆMOGLOBIN AND SYSTOLIC AND DIASTOLIC BLOOD PRESSURE OF THE SERIES OF STUDIED CASES

(Fig 2). No attempt was made to correlate the total cell mass with these factors because of its very variable character. The hæmoglobin show a significant rise ("t" = −4·20) during the anæsthesia; but no correlation exists betweeen the rise of hæmoglobin and decrease of plasma volume. The coefficient of correlation is −0·04.

Similarly, the systolic and diastolic readings of blood pressure show no correlation with the change of plasma volume in an unselected series of cases as shown (Table 7).

The analysis between the different kinds of operation classified according to the severity as major and minor cases shows no significant difference in the change of plasma volume with the time. The value of "t" is −0·547.

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TUBERCULOSIS OF THE ANKLE-JOINT

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Tuberculous infection of the ankle-joint occurs in adults as well as in children. The spread of this disease can be better understood if a correct appreciation is made of the anatomy of the ankle-joint.

The ankle-joint is formed by the lower end of the tibia and fibula which forms a mortise to accommodate the astragalus which is called the keystone of the arch. This astragalus has a body, neck and head. The superior and lateral sides of the body articulates in the mortise formed by the tibia and the fibula and the interosseous ligament with a synovial membrane. The under surface of the body articulates with the os calcis and the head with the scaphoid and is covered by separate synovial membranes. The blood supply to the body passes along the anterior, posterior, medial

and lateral ligaments and also along the interosseous ligaments between the scaphoid and the head and also along the ligaments connecting the under surface of the os calcis (Fig. 1).

FIG. 1.—SHOWING THE SCHEME OF ARTERIAL SUPPLY OF THE ASTRAGALUS

It is well known that tubercle bacilli invade the bones and joints through the blood vessels and may get localised at the metaphysial ends of the bone like the tibia (Fig. 2) and the fibula. If it affects the metaphysial end of tibia the joint may not get involved and if at all, it will be in the very late stage of the disease. It affects the metaphysial end of fibula rarely and when it is involved it may secondarily infect the joint quickly by contiguity as the metaphysis of the fibula is at the joint level.

Sometimes the infection spreads directly to the synovial membrane through the blood stream as a primary infection and this happens more commonly in adults. The infection may start in the astragalus and this happens more frequently in children. Usually the focus appears just at the level of the neck and then spreads backwards and laterally and later when it bursts it spreads quickly in the joint. The tendon sheaths which are in juxtaposition with the joint usually get involved. Early spread to the subcutaneous tissues round about the ankle occurs forming an abscess which when opened refuses to heal with formation of several sinuses. These latter when infected with secondary organisms not only cause locally great pain, swelling, discomfort and deformity but also endanger life. It was established some years ago at Muktesar Veterinary Laboratories that bovine tuberculosis is rare in India. We should not take it for granted that this opinion is irrevocable. Further investigations are necessary to confirm or disprove this. It is presumed that the human type of tubercle is responsible for this condition.

SIGNS AND SYMPTOMS

First a limp is noticed after exertion. Pain becomes apparent with lameness and becomes severe during plantar flexion in the early stages due probably to the stretching of the ligament attached to the neck of the astragalus. The position of the angle varies with the stage of the disease and whether the involvement is osseous or synovial. Early in osseous disease the ankle is held in dorsiflexion to relax the anterior ligament, later the ankle is held in plantar flexion to avoid weight-bearing on os calcis. The general condition remains good but slight wasting of the calf muscles becomes appreciable. Later, the ankle assumes a position of equinovalgus. The gait becomes altered early in the course of the disease and the patient walks as if the ankle is stiff, later when equinus deformity is well-established he walks on the toes. The swelling comes early. It is first noticed in front as a uniform fullness beneath the extensor tendons, in astragalus infection if the disease is localised at the neck. Later, it is found around the malleoli.

In a pure synovial infection the swelling may be seen early around the malleoli. The most important clinical sign of any joint involvement is limitation of movement in all directions. In the case of the ankle-joint plantar movement and dorsiflexion will be limited. At this stage pain becomes more severe and unbearable with marked swelling, general emaciation and local wasting of the calf muscles. Evening rise of temperature becomes more appreciable at this stage. The deformity is either equinus (Fig. 3) or equinovalgus. A sudden relief of symptoms occurs when the disease bursts through into the ankle-joint from astragalar spread but this relief lasts for a brief period. The joint becomes more swollen, pain increases, general condition deteriorates and when the disease progresses superficially the skin becomes shiny, either it bursts through or it is inadvertently incised. This is the starting point of multiple sinuses and when secondary infection occurs it is most distressing to the patient. Sometimes the disease spreads to other joints, chiefly neighbouring tarsal joints when it becomes impossible to save the limb. Knee and hip joints also get involved and in one child the disease was found in the ischial ramus (Figs. 4, 4A and 4B) with abscess formation and was mistaken for hip joint infection. At this stage cough appears and when the sputum is examined it proves positive for tubercle bacilli. When the disease progresses further, more sinuses appear both in the medial and lateral aspects and on the dorsum of

Fig. 2— Radiogram showing tubercular focus on the metaphysial side of the tibia. Note the rarefaction.

Fig. 3—Photograph of a tubercular ankle with multiple sinuses covered by dressing with bandage showing marked talipes equinus.

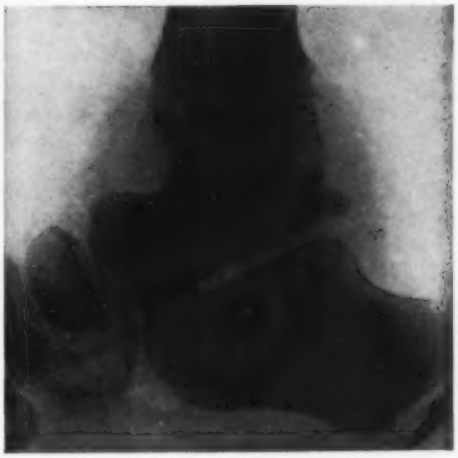

Fig. 4—Radiogram showing a worm-eaten appearance of the posterior part of the astragalus with sclerosis in front part of body.

Fig. 4A—Radiogram showing ulceration on the outer and superior surface of the astragalus. A. P. view.

Fig. 4B—Radiogram showing the involvement and destruction of the ascending ramus of the ischium which formed an abscess simulating hip joint disease.

Fig. 5— Photograph illustrating the trolly improvised from a discarded perambulator. Note the incorporation of the Thomas's knee splint in plaster to prevent weight-bearing.

Fig. 6—Showing the special type of caliper with a patten incorporated preventing weight-bearing on the ankle. Note also patten on sound side to equalise limbs.

Fig. 7— Radiogram (lateral view) showing rarefaction with cavitation in the neck of the astragalus.

Fig. 7A—Radiogram (A.P. view) showing no noteworthy change in the ankle-joint.

Fig. 7B—Radiogram (lateral view) after astragalectomy.

Fig 7C—Photograph of the ankle-joint before operation.

Fig. 7D—Lateral view of ankle showing scar after astragalectomy.

Fig. 7E—Photograph 6 months after operation.

the ankle as well. Further wasting of the calf muscles is a noticeable feature with a marked general loss in weight and a more pronounced evening rise in temperature and a subnormal morning temperature.

Diagnosis

Any swelling localised to the ankle-joint in children and adults which comes on insidiously must be suspected to be due to tubercle bacilli. Sometimes among the adults there is a previous history of breaking down and healing of tubercular glands and also a slight accident. X-rays afford a means of early diagnosis in osseous type of infection which shows rarefaction and cavitation in some cases. In the synovial type early diagnosis is difficult by x-ray but suspicion is aroused when the joint space becomes narrowed down. When the articular surface shows irregularity with decalcification of the ends of bones forming the joint, it becomes easy to diagnose this condition.

Treatment

A careful study with a view to arrive at a diagnosis will enable one to adopt the correct line of treatment. Rest—continuous, prolonged and enforced, enunciated by the late H. O. Thomas is the sheet anchor of treatment. It is difficult to enforce this among the children and adults under Indian conditions due to poverty. General hospitals cannot afford to keep them long with a well-planned scheme for undertaking this treatment. With this type of conservative treatment adopted from the start even under the prevailing home conditions some children have recovered and have reached adulthood, but more often the disease spreads not only locally but also to other situations. Ultimately, generalised tuberculosis carries them away. Such a state of affairs is not uncommon. The preventive scheme of B.C.G. vaccination has to be watched with keen interest in the control of incidence of bone and joint tuberculosis.

The scheme adopted by the author to enforce rest in tuberculosis of the ankle-joint is by encasing the leg in plaster of Paris from below the knee to the toes and incorporating a Thomas's knee splint, long enough to prevent the child from standing. This is enclosed in plaster of Paris right up to the groin. Such a type of conservative domiciliary treatment helps to improve the general condition. It is difficult, however, to keep the splint without deterioration as both adults and children glide along on their buttocks using hands as crutches wearing out the ring of the Thomas's knee splint and the heel portion of plaster of Paris. It is also difficult to see them at weekly, fortnightly or monthly intervals to repair the damage that occurs to the splint or watch the effect on the general condition. This is due to the cost of transport and also the congestion in public transport. An ingenious mechanically minded parent devised a trolly from a discarded perambulator to help his child to move about by herself (Fig. 5). Such a contrivance has improved not only the general condition of the child but has afforded a means of getting about without damage to the splint adding to the mental comfort of the child. This has been copied in the Children's Orthopædic Hospital, Bombay. Administration of para-amino salicylic acid, of streptomycin alone or along with penicillin in cases with secondarily infected sinuses has helped to improve the general condition and healing process. In early cases instillation of streptomycin into the joint with parenteral administration of the same drug combined with rest has helped in accelerating healing process permitting ambulation.

When ambulation is desirable special type of calipers with patten to prevent weight-bearing is prescribed. A patten of the boot of the normal side helps to equalise the limbs (Fig. 6). This is expensive and is beyond the means of poor patients unless some social service organisation comes to the aid. For poor adults who cannot afford this prolonged treatment the focus of infection is eradicated by excision and arthrodesis. Astragalectomy is done when the focus is confined to astragalus supplemented by excision of all tubercular synovial tissue. This type of operation is done both in adults and in children but post-operative care, however, is essential. In all cases after operation ½ gm. of streptomycin and 4 lac units of penicillin is instilled in the dead space after suturing the wound and the limb below the knee is put in plaster of Paris for a period of two months. Primary healing resulted even in cases with sinuses. In operated cases with sinuses streptomycin is continued after operation until an average dose of 20 gms. in children is completed. However, it is essential to enforce rest for a period of 4 months after the operation. Prescription of boots with required compensation obtained after measurement is essential. Patients get a fair range of function at the ankle-joint after a proper astragalectomy operation (Figs. 7, 7A, 7B, 7C, 7D and 7E). These figures show x-ray pictures before and after astragalectomy and also clinical results). In advanced cases with secondary infection amputation may relieve the suffering. With multiple foci of infection in other joints this operation has to be done with a certain degree of circumspection. Therapeutic trials of the new drug Nydrazid (Squibbs) or its allied products under different proprietary names is worth trying in both bone and joint tuberculosis.

Use of sunlight for promoting healing has been tried. In some cases where this has proved useful the parents have kept a valuable record as directed by the author. The treatment of this condition to be effective, therefore, is not only a question of time but is costly also. It is essential, however, that every big city in India should have a specialist hospital for this disease with a social service organisation to help and solve some of the difficulties of poor people not only to prevent crippledom but also to help to save the poor parents from the agony of prolonged painful illness of their children or their near dependents.

A STUDY OF TETANUS IN THE MEDICAL COLLEGE HOSPITAL, NAGPUR

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Tetanus has attracted the attention of clinicians since ages. The advent of antitoxin in the field of treatment has not been able to remove its sting to any great extent due to the indissociable nature of the toxin-protein combination in the anterior horn cells. This is the reason why the attention of research workers nowadays is mainly directed to the control of spasms. During the last 10 years many antispasmodics have been discovered with varying range of activities. The older antispasmodics like bromides, chloral hydrate, paraldehyde, barbiturates and anæsthetics like ether, and chloroform act mainly by depressing the cerebral functions. Myanesin is a comparatively recent discovery acting mainly by depressing the spinal reflexes. It is given by oral, intramuscular and intravenous routes. It works satisfactorily when given intravenously in a 10 per cent solution till the desired relaxation is obtained. It was used by Belfrage (1947), Torrens *et al* (1948) and Davidson *et al* (1949). The results were encouraging.

The deadly weapon of Red Indians—curare—was used by Cole in 1934, Mitchell in 1935 and West in 1936. It acts by blocking the neuromuscular transmission at the end-plates of the motor nerves. D-tubocurarine in beeswax and oil was tried by Weed *et al* (1948) in doses of 100 mgm. to 300 mgm. in cases of tetanus with success.

These drugs are not without danger and require an expert supervision and a respirator at hand in case respiratory paralysis is precipitated.

Study of Cases

A study of 88 cases was undertaken from January 1950 to January 1952. Out of these 56 were males (63·6 per cent) and 32 were females (36·4 per cent). Majority of patients were under 20 years of age.

	Age groups in years				*Total*
	1—5	6—10	11—20	Above 20	
No. of cases in each age group	16	11	23	38	88

Mode of infection.—History of injury or some obvious site of infection as otitis media in children was available in 61 cases (69·4 per cent and none at all in 27 cases (30·6 per cent).

The following were the types of lesions associated with tetanus.

1. Injury with definite presence of wound—33.
2. History of wound which had healed upon admission—4.
3. Otitis media—4.
4. Small pox vaccination—4.
5. Quinine injection—2.
6. Abortion or recent delivery—8.
7. Burns—3.
8. Tetanus neonatorum—3.

In children under 4 years the main causes of tetanus were small-pox vaccination and otitis media and in new-born infants umbilical sepsis. In women abortion or recent delivery were the main causes.

Initial symptoms.—In the majority of cases lock-jaw was the initial symptom. In three cases pain in the throat during swallowing and in a similar number of cases gradually developing stiffness of the body were the main initial symptoms. In two cases patients complained of difficulty in breathing as the initial symptom.

Treatment

Antitoxin treatment.—The best route of administration of antitoxin as agreed upon by most clinicians is intravenous. Lately, antitoxin has been tried intrathecally, the dose being near about 20,000 units after draining away an equal volume of cerebrospinal fluid. This route is not favoured by most clinicians on the ground that antitoxin sets up a mild serous meningitis which aggravates spasms.

In our patients the antitoxin injected on admission, was 160,000 to 200,000 units, a part of which ranging from 60,000 to 100,000 units was injected intravenously well diluted in saline and the rest given intramuscularly. When history of allergy was forthcoming ½ c.c. of adrenaline (1: 1000) was injected subcutaneously half an hour before the serum administration.

Repetition of serum was not needed in most cases. In the words of Leslie Cole "to continue to give very large doses of antitoxin day after day when the condition is improving or when only tonic rigidity remains is worrying to the patient and a great waste of money and serum. In very few cases 60,000 to 100,000 units of antitoxin was repeated intramuscularly 5 to 6 days after the initial dose when no improvement was noticed in the patients' condition.

Local treatment of wounds—Ordinary wounds were well washed with 1 per cent boric lotion and dressed with 5 per cent sulphathiazole ointment. Big sloughing wounds were washed with hydrogen peroxide and dressed with gauze soaked in saturated magnesium sulphate solution and the area round the wound was infiltrated with 10,000 units of antitoxin. Debridement of dead and infected tissue was carried out next day. Secondary sepsis was treated with sulphonamides by mouth or penicillin injections.

Control of spasms—Bromides were found to be of no use. Phenobarbitone acted better and was given in doses of 1½ gr. t.d.s. to adult patients. During severe

spasms 4 to 8 cc. of paraldehyde was injected intramuscularly and in some cases 2 cc. was injected intravenously well diluted in normal saline. It acted very promptly and effectively, the only drawback being the production of an irritant bronchitis in 20 per cent of cases. Injections of magnesium sulphate 25 per cent intramuscularly and 5 per cent intravenously were tried in 3 cases but the results were not as satisfactory as with paraldehyde.

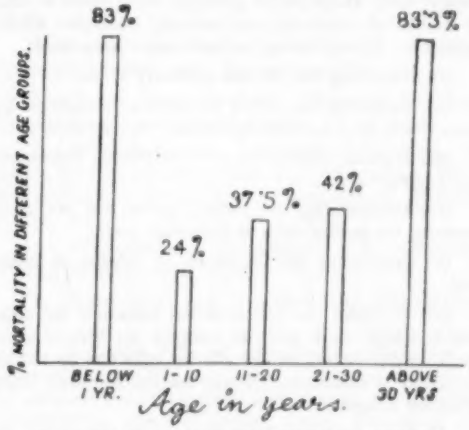
Progress of Disease

The classical progress of tetanus i.e., lock-jaw, rigidity of muscles, spasms, was observed in the majority of cases. In 5 cases the disease was arrested at the spastic stage only. These cases were not attended with any mortality.

Causes of Death

The death in tetanus was mainly due to spasm of respiratory muscles leading to asphyxia or exhaustion and ending in cardiac failure. In other cases sudden laryngeal spasm or aspiration pneumonia were the main causes of death. In 2 cases the temperature shot up above 105°F. and patients succumbed.

Mortality figures—A study of the mortality rate shows it to be higher in males than in females. Out of 56 males admitted, 30 expired—a mortality of 53·5 per cent while out of 32 females admitted only 12 expired—a mortality of 37·5 per cent. On the whole the mortality was 47·7 per cent. The figures show that the mortality may be associated



Graph Showing Mortality Figures in Different Age Groups

with better muscular development in males which gives more forceful spasms leading to greater exhaustion. A study of mortality according to age groups was found to be highest in infants below 1 year and adults above 30 years and lowest between 1 and 10 years (*vide* Graph).

Incubation Period and Period of Onset as a Guide to Prognosis

The incubation period as is, usually calculated, i.e., the time interval between sustaining an injury and the development of lock-jaw is erroneous since it is impossible to say as to when a wound actually got infected with tetanus spores. There were patients who were being treated for chronic ulcers of about 3 months duration and who ultimately developed severe type of tetanus and expired. In our study of cases patients who developed tetanus within 3 days of receiving an injury invariably succumbed.

On the contrary, the period of onset which is the interval between the development of lock-jaw and the first generalised spasm is a better guide to prognosis as it can be accurately estimated. A period of onset within 24 hours was associated with 74 per cent mortality and within 12 hours 100 per cent.

Apart from the incubation period and period of onset, the degree of relaxation of muscles in between spasms was also helpful in giving prognosis to a certain extent. A more or less continued tonic state in between spasms without any appreciable relaxation was attended with a high mortality.

Discussion of Problems Associated with Tetanus

During the study of these cases it was found that even a minor wound could give rise to tetanus and in some cases tetanus appeared even after the healing of wounds. Tetanus without any obvious wound or injury formed 30·6 per cent of the total cases studied. This fact makes one think of the obscure sites of chronic infections in adults, e.g., carious teeth, a suppurating sinus or an intestinal ulcer (!) where the tetanus bacilli can grow and give rise to the socalled 'Idiopathic Tetanus'.

There is also a lot of confusion as to the role of antitoxin in the treatment of tetanus. Workers like Bryant and Fairman treated 22 cases of tetanus with sulphapyridine and sodium evipan with only 5 deaths without the use of antitoxin. These figures compare quite favourably with the best of clinics where antitoxin is freely used. Is it that the result mainly depends upon the choice and judicious use of a good sedative or antitoxin plays any part? The answer is difficult to give as no large scale controlled study has been carried out in patients with and without the use of antitoxin. According to our observations a large dose of antitoxin could reduce the severity of spasms in a few cases remarkably when large doses of paraldehyde failed.

Summary

A statistical study of 88 cases of tetanus is undertaken. The value of the period of onset as against the incubation period is brought out. The degree of muscular rigidity in between spasms is shown to be of help in giving prognosis. A short discussion about the probable causation of 'Idiopathic Tetanus' and the role of antitoxin in the treatment of tetanus is given.

PRACTITIONERS' CORNER

ANTIHISTAMINE DRUGS IN GENERAL PRACTICE*

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INTRODUCTION

The discovery of specific histamine antagonists in recent years has made a very notable contribution to the pharmacotherapy of allergic diseases. These substances are of considerable benefit in the management of a large number of allergic diseases and have found an important place in the armamentarium of the medical practitioner. They have also proved very valuable tools of medical research and have helped to confirm, discard or modify the existing concepts regarding the role of histamine in various pathological states.

ROLE OF HISTAMINE IN ANAPHYLAXIS AND ALLERGY

Before undertaking a discussion of antihistamine drugs it will be interesting and profitable to review the part played by histamine in 'anaphylaxis' and 'allergy'.

The demonstration of the phenomenon of anaphylaxis in 1889 by Richet was largely responsible for better understanding of allergic diseases. Richet showed that if a dose of 'sea anemone poison' was injected into a dog, then a second dose injected a few days later produced severe toxic reactions. Arthus in 1903, proved that a similar reaction could be demonstrated with 'nontoxic proteins'.

Attention was also directed to the fact that clinical symptoms of such conditions as asthma and hay fever closely resembled anaphylactic reaction in a guinea pig. Dale and Laidlaw (1911) pointed out the similarity of manifestations of the effect of histamine and of anaphylactic shock. This served as the starting point of a large amount of experimental evidence incriminating histamine as the mediator of anaphylactic reaction. The demonstration by Best *et al* (1927) of histamine as a normal constituent of many body tissues disclosed the source of histamine in anaphylactic reactions. All manifestations of anaphylactic reactions cannot be explained by histamine alone; it is undoubtedly a potent factor. The present concept of anaphylaxis may be stated as follows:

"It is postulated that reaction of the specific antigen with the specific antibody causes in some way the release of histamine from its bound inactive state and which on release attacks the susceptible cells. Dale (1948) suggests that the different symptomatology in different animal species may be related to differences in distribution of the sensitizing antibody in the various organs of the body".

It is difficult to reconcile that 'anaphylaxis' and 'allergy' are synonyms. We have come to regard allergy as a manifestation of specific hypersensitiveness. However, most observers are agreed that these phenomena are related and that histamine is the main offender in either case.

PHARMACOLOGY OF HISTAMINE

Histamine was first isolated by Barger and Dale in 1910 from ergot. Dale and Laidlaw (*loc. cit.*) studied the effects of histamine in various animal species and described its actions. Histamine chemically is β-iminazolylethylamine and is formed from amino acid histidine by decarboxylation. This reaction is easily brought about by bacterial action.

The general response to histamine consists of:

(*a*) Contraction of the plain muscle in the intestine, uterus and bronchioles. (*b*) The effect on circulation varies in different species but generally the blood pressure is reduced. (*c*) Capillaries are always dilated and made more permeable. (*d*) The histamine response in human skin was aptly summarized by Lewis (1927) as 'triple response'. (*e*) Histamine is a powerful stimulant of most glandular secretions including hydrochloric acid.

ANTIHISTAMINE AGENTS

Having allocated to histamine an important role in 'allergy' and 'anaphylaxis' attempts were made to find out means of combating or reducing histamine manifestations. The following methods have been tried:

(*i*) Preventing the antigen antibody union.

(*ii*) Modifying the action of liberated histamine by drugs which have a reversing action, e.g., epinephrine.

(*iii*) Directly destroying or neutralizing histamine, e.g., histaminase.

(*iv*) Desensitizing the tissues against the action of histamine by graded dose of histamine itself.

(*v*) Preventing the formation or release of histamine.

(*vi*) Blocking the action of the histamine by compounds which unite with or compete for histamine or which fix themselves on the effector cells and so inhibit the action of histamine. These are the so-called 'antihistamine drugs'.

All these measures have been tried and found ineffective. Initially attempt was made to raise the tolerance of man and animals to histamine. Closely related was the attempt to desensitize the individuals on the basis that they were sensitive to histamine. Reports about their utility are widely varying. Hill and Martin (1932) listed 165 substances or methods for combating histamine effects, of widely divergent drugs or means, as

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atropine, barium chloride, heparin, chloral hydrate, lowered barometric pressure, sodium bicarbonate.

New Antihistamine Era

The credit of introducing really potent and specific antihistamine drugs goes to Bovet and his colleagues (1937) working at the Pasteur Institute in Paris. This was an extension of the classical investigations of Fourneau and his associates on specific antagonists of adrenaline and acetylcholine.

The first compound with a definite antihistamine action to be studied by Bovet and Staub (1937) was a phenolic ether 'thymoxyethyldiethylamine' or 929F. It was, however, too toxic. In 1939, Staub introduced the first *ethylene diamine derivative* (1571 F). In 1942 Halpern described his observations on 2325 R.P. and 2339 R.P. (Antergan). the latter was a much more powerful antagonist than 1571 F.

In 1944, Bovet introduced the still more potent *Neoantergan* (Mepyramine, Anthisan or 2786 R.P.).

In 1945, Mayer introduced a closely related compound *Pyribenzamine*.

In 1945, Loew *et al* introduced *Benadryl* (Diphen hydramine).

In 1947, Halpern reported the powerful antihistamine action of *Promethazine* (3277 R.P., Phenergan). Other drugs of this group are *Antistine* (Maier and Bucher, 1946, *Hetramine* (Feinstone *et al*, 1946), *Neohetramine* (Reinard and Scudi, 1947), *Chlorothen* (Litchfield *et al*, 1947) and *Thephorin* (Lehmann, 1948). The chemical structure of Thephorin is distinct from others.

A chlorocyclizine derivative 'Histantine' has been developed by Burroughs Wellcome and Co.

The list is very formidable. However, the drugs fall into the following main groups:

1. *Ethylene-diamine derivatives*: Comprise the largest number of compounds, *e.g.*, Phenergan, Histadyl, Chlorothen, Neohetramine, Neoantergan, Pyribenzamine, etc.

2. *Ethanolamine derivatives*: *e.g.*, Benadryl (Diphen Hydramine).

3. *Monamines*: *e.g.* Trimeton and Chlor-Trimeton.

4. A fourth type of compound is illustrated in *Chlorocyclizine* which contains a piperazine in place of the conventional ethylene-diamine linkage and a methyl substituent in place of diethyl groups present in the other compounds.

5. *Miscellaneous compounds*: *e.g.*, Antistine, Thephorin, etc.

Action of Antihistamine Compounds

The chief action of the antihistamine compounds is their direct antagonism to histamine.

They combat the blood pressure lowering action of histamine in anæsthetized cats or dogs. They also antagonize the increased capillary permeability. Bain *et al* (1948) showed that they are also effective in inhibiting the histamine wheal in man. Histamine induced gastric secretion is not neutralized. Indeed, there is evidence that gastric secretion may be increased (Ashford *et al*, 1949).

In addition to their antihistamine effects they possess in varying degrees anti-acetylcholine, local anæsthetic, sympathomimetic or sympatholytic actions. Antispasmodic and quinidine-like properties have been shown by some members of this group (Dews and Graham, 1946); Sherrod *et al*, 1947). In man these drugs, specially Benadryl, have a central depressant action and produce drowsiness.

Mode of action—How do the antihistamine drugs act? There is evidence to show that these drugs do not prevent the release of histamine from the tissues nor do they combine with or destroy histamine. It is still less likely that they act as physiological antagonists. The hypothesis that they may act by potentiating adrenaline action is annulled by the finding of potent antihistamines which are anti-adrenaline. All available evidence suggests that these drugs antagonise histamine by offering themselves to the tissue receptors and thus blocking the histamine response. In other words, they act by 'substrate competition'.

Dosage and Mode of Administration

The antihistamine drugs are usually administered orally in the form of capsules, tablets or as a syrup. They are occasionally given subcutaneously, intramuscularly or rarely intravenously. The parenteral route is, however, hardly justified and the intravenous route should be used with great caution as casualties have been reported. Oral administration is the method of choice. Hunter and Dunlop (1948) have suggested the following schedule: "Benadryl and Pyribenzamine are usually prescribed in doses of 50 mgm. and Anthisan and Antistine in doses of 100 mgm. The maximum daily dose of Benadryl is about 400 mgm. of Pyribenzamine 600 mgm. and Antistiae and Anthisan 800 mgm. The drugs are quickly absorbed and quickly excreted in the urine so that the effect of a single dose lasts only from 4-6 hours. Evidently, the drugs must be administered three times a day, and in some subjects it is necessary to give an additional dose as late as possible at night so as to 'cover' the hours of sleep. Children tolerate these drugs well and over the age of 12 years, the adult dose can be given. For intravenous use Benadryl solution of 10 mgm. per c.cm. should be used very cautiously and only in an emergency. The patient should always be instructed to swallow the tablets or capsules whole as these drugs have a strong local anæsthetic action. Promethazine and Histantine have a very prolonged action and can be given twice daily.

Local application of antihistamine is sometimes beneficial where oral administration fails. Hunter and Dunlop (1947) have treated successfully some cases of rhinitis by local application when the oral administration failed. Feinberg and Bernstein (1947) have used this method succeessfully in cases of itching dermatoses, It will be interesting to know that Epstein (1947) has reported development of dermatitis following local application of pyribenzamine.

Aerosols for Asthma—Since oral administration of antihistamines has little effect in asthma, topical application of *aerosol* was considered. Feinberg used a 2 per cent solution of Pyribenzamine by means of a hand-operated nebulizer with good response. Since the drug inhaled is small the treatment can be repeated frequently.

Other routes of application described are iontophoresis, as suppositories, as nose drops and eye drops.

Duration of Treatment—As has been stated antihistamine drugs do not in any way correct the basic pathology or allergy. They are palliatives and symptoms tend to recur when the drugs have to be continued indefinitely or till such time as the allergy subsides spontaneously or as a result of artificial or natural desensitization.

Therapeutic Uses

(A) Dermatoses:

(1) *Urticaria and angioneurotic œdema*—Gate, Thiers and colleagues (1942) were the first to use Antergain in the treatment of urticaria with very encouraging results. Since then a large number of workers have tried these drugs in urticaria and angioneurotic œdema. Benadryl, Anthisan, Pyribenzamine and Antistine have been used. All of them afford symptomatic relief. These drugs are found to be more effective in acute urticaria than in chronic cases. Occasionally, a patient refractory to one drug may respond to another. In cases of acute emergency like swelling of tongue or œdema of the glottis, a subcutaneous injection of adrenaline is the drug of choice. The first obvious effect of these drugs is a marked relief of itching, the œdema taking some time to disappear. They prevent the development of new lesions, the existing ones disappearing in course of time. The drugs should be continued for some days after the lesions have disappeared and withdrawn gradually. A sudden withdrawal has been known to precipitate the allergic condition.

In chronic cases the antihistamine drugs may be given for several months and a small maintenance dose has been known to keep the symptoms in check. Hunter and Dunlop report several cases who have been taking Anthisan for two years. This shows that no tolerance is developed. Angioneurotic œdema shows a slower and less complete response to antihistamines, primarily because itching is not a factor and because œdema is more deep-seated involving the muscles and joints.

Reports of Feinberg *et al*, (1946), O'Leary and Farber (1946) and Waldbott (1948) indicate that roughly 80 to 90 per cent of patients with acute urticaria can be benefited by antihistamine drugs.

(2) *Pruritus*—These drugs have been used to relieve itching in many dermatologic lesions, and pruritus due to other causes. Friedlander and Feinberg (1946), Lynch (1947) reported marked relief from the use of these drugs in cases of pruritus vulvæ and ani. In 20 out of 25 cases of atopic dermatitis, Friedlander *et al* noted relief from itching. Hunter and Dunlop (1947) report beneficial effect in the control of pruritus of obstructive jaundice. Witten (194), however, in a study of several hundred cases found that a strong antipruritic effect was exerted by antihistamines in only 10 per cent of itching dermatosis, excluding urticaria.

(3) *Contact dermatitis*—Antihistamines are only partially successful in contact dermatitis. Local application is more beneficial than oral administration. The most important factor consists of removal of the ætiological agent.

(4) *Atopic dermatitis or eczema*—In the management of eczema the results are not as encouraging as in urticaria. They seldom cause complete regression and in many cases there is no relief whatsoever. It however, helps to relieve the itching which leads to improvement of the patient's condition. None of the compounds is outstandingly beneficial in the management of eczema. Local application is worthwhile trying.

(5) *Dermographism* is essentially urticaria caused by traumatic stimuli and the results of treatment with antihistamines are similar as in the case of urticaria.

(B) Allergic Reaction to Drugs:

The work of Landsteiner and Chase (1941) among others has shown that drugs combine with body proteins to form antigenic compounds which may lead to the production of hypersensitiveness. Acute urticarial type of toxic manifestations are benefited but a large group of other toxic reactions is not at all influenced. Allergic reactions to liver extract, insulin, penicillin, streptomycin and serum usually respond well to antihistamines.

(C) Respiratory Allergy:

(1) *Asthma*—The observations of Curry (1946), that histamine induced bronchospasm in the human asthmatic subject, raised great hope that antihistamines may be useful in this malady. In the beginning there were very conflicting reports. Careful clinical investigations by Leavy and Seabury (1947), Hunter and Dunlop (1948) and Southwell (1948) have finally decided that these drugs are of little or no avail in the management of bronchial asthma.

(2) *Hay fever and perennial allergic rhinitis*—Most observers are agreed that these drugs are very effective in hay fever. 85 to 95 per cent of cases have been

reported as relieved or considerably improved. In all allergic rhinitis the most striking effect is the relief of itching and sneezing. Œdema takes time to disappear. Associated nasal polyps should be treated. Hunter and Dunlop (*loc. cit.*) using stricter control-'biopsy of the nasal mucosa', found that only 45 per cent of cases were relieved with return of the nasal mucosa to normal.

(D) Alimentary Allergy:

Improvement in cases of alimentary allergy have been reported. The final picture is not yet clear. Elimination of the known offending food is more rational.

(E) Radiation Sickness:

The actual status of these drugs in radiation sickness seems in doubt. Loffstorm and Nurenberger (1946) using Benadryl claimed good results in the treatment of radiation sickness. Hunter and Dunlop undertook a very careful study. They gave Anthisan to every alternate case of cancer of the breast receiving same standard dose of x-rays. To the control, dummy tablets looking like anthisan were given. They were convinced that these compounds were ineffective.

(F) Motion Sickness, Nausea and Vomiting:

Gay and Carliner (1949) showed that Dramamine, the 8-chlorotheophylline salt of diphenylhydramine completely relieved or prevented motion sickness. It is not as effective in air sickness as in sea and car sickness. In a carefully controlled trial it was shown that 372 of the 389 sea-sick soldiers were completely relieved within one hour of oral administration of a single dose of 100 mgm. of Dramamine. The usual dose of 100 mgm. five hourly produces no side effects.

Carliner, Radman and Gay (1949) used Dramamine to treat *nausea and vomiting of pregnancy* with *gratifying results*. 31 of the 43 patients were completely relieved in three hours with a single dose of 100 mgm.

Bignall and Crofton (1949) report successful relief of nausea and vomiting due to *streptomycin therapy*. The giddiness was not affected.

(G) Diseases of the Central Nervous System:

(1) *Petit mal*—Churchill and Gammon (1949) reported that Benadryl diminished the electro-encephalographic abnormality and reduced the frequency of attacks of *petit mal*. In patients with focal lesions the seizures were actually increased.

(2) *Parkinsonism*—In 1948, Budnitz reported the use of Benadryl in Parkinsonism. Rayn and Wood (1949) used Benadryl in 40 cases of Parkinsonism. The most striking benefit was relaxation of rigidity. The tremors were not affected.

A synergistic action between Benadryl and atropine has been noted.

(3) *Migraine*—The results in the treatment of migraine are variable.

(H) Miscellaneous Conditions:

(1) *Eye Diseases*—The use of these drugs in allergic eye diseases is generally satisfactory. In cases of conjunctivitis, the burning, itching, photophobia and lachrymation was appreciably relieved. Local application to the eye should be done with caution, as some of them are irritants and Benadryl produces mydriasis.

(2) *Collagen diseases*—The findings of Rich and Gregory (1943) showed that polyarteritis nodosa is a hypersensitivity reaction and that lesions resembling rheumatic fever and other collagen diseases could be produced in rabbits by the injection of a foreign protein. This prompted the use of antihistamines in these diseases. The results are inconclusive and so far disappointing.

(3) *The Common Cold*—When newly introduced antihistamines were hailed as 'the remedy' for common cold specially by the lay press, not a few observers reported favourably. However, carefully planned experiments have shown that these drugs are useless. The best controlled experiment was conducted by the U. S. Navy under Commander J. R. Seal (1950). Great care was exercised in diagnosing cold by clinical and immunological methods. The evidence conclusively points that antihistamines neither prevent nor alter the course of common cold.

(4) *Acute Nephritis*—The use of these drugs in acute nephritis has been disappointing. Graing *et al* (1949, however, claim satisfactory results with mepyramine. The results are inconclusive.

Toxic Effects

Toxic effects with these drugs are fairly frequent. The principal side effects of most antihistamine drugs are *sleepiness and fatigue* which is most freequent with Benadryl and least with Thephorin. The drugs should, therefore, be given with caution to persons performing skilled work, such as motor driving. The drowsiness can be minimized by giving the drug in smaller doses in the beginning and reaching the full therapeutic dose in three to four days or by giving amphetamine 5 mgm. in the morning and at mid-day. Amphetamine can be withdrawn after a few days. Care should be taken if hypnotics and sedatives have to be simultaneously administered.

Effects on the gastro-intestinal tract include *nausea, vomiting, mild colic* and *diarrhœa. Dizziness, headache, dryness of the mouth and nose* are also frequent. *Dermatitis* following local application has been reported by Epstein (1948). Bain (1948) reports light headedness, aching limbs and ataxia with Promethazine.

Unusual toxic effects—These effects are common when a very big dose is given or the drug is taken by susceptible individuals. Several cases of *agranulocytosis* have been reported (Blanton and Owens, 1947). Crumbley (1950) has reported three cases of *hæmolytic anæmia.*

After a single large dose, *disorientation*, convulsions and coma with *incontinence of urine* are reported (Borman, 1947). *Deaths* have been reported following large doses of antihistamines specially in babies and young children (Tobias 1949 and Rives *et al*, 1949). Death usually occurs in six to fifteen hours although more rapid deaths have been reported. A generalised skin-rash may occasionally be seen.

It must be remembered that there is considerable individual variation and if one drug is not tolerated, others may prove satisfactory.

The *relative toxicity* of various antihistamine compounds has been assessed by Hunter and Dunlop (1948).

Feinberg (1946) found that a single dose of 100 mgm. of Benadryl will cause side effects in over 50 per cent of cases. Britton and Ingram (1947) claim that with Antistine the incidence is only 37 per cent. With a daily dose of 600 mgm. of Pyribenzamine the side effect is in only 20-30 per cent and with Anthisan 600-800 mgm. daily, the incidence is only 23 per cent. The practical superiority of Anthisan and Pyribenzamine over Benadryl lies in the fact that they are more active weight for weight and can be tolerated in much larger doses. The newly developed Histantine, a chlorocylizine compound, is credited with greater duration of action and fewer side effects (Jaros *et al*, 1949).

Newer Dpugs in Allergy

An evaluation of drugs used in the treatment of allergic disorders would be incomplete without a mention of ACTH and cortisone. Some cases of asthma and status asthmaticus have responded well to the use of these hormones. The diffuse pulmonary infiltration as seen on x-ray in Loffler's syndrome disappears completely with treatment. The improvement in cases of lupus erythematosus has been very gratifying. They have proved useful in serum sickness, drug sensitivity and atopic dermatitis. Since no comparative study has been undertaken it is difficult to say how they compare with antihistamines. It is, however, clear that like antihistaminics the relief is only temporary.

Summary

The role of histamine in anaphylaxis and allergy is very briefly reviewed. It is now agreed that 'histamine' plays a very important part in both these manifestations. Pharmacology of histamine and antihistamine compounds has been discussed. The antihistamine compounds besides annulling the effects of histamine, have a sedative effect on the nervous system. They have also an adrenaline-like and atropine-like action. Some of them are adrenolytic and most of them are local anæsthetics.

The drugs are best given orally in divided doses. Mode of administration and side effects are discussed. Atropine-like drugs and hypnotics should be cautiously given with antihistamine drugs. These drugs should not be given when intradermal tests are being carried out and to persons doing skilled work or in charge of public vehicles.

Antihistamine drugs produce dramatic effect in urticaria, hay fever and allergic rhinitis. They have been found effective in reducing or controlling drug sensitivity, especially to liver extract, insulin, penicillin and sulpha drugs and serum sickness. Recently, they have beeen found very effective in controlling travel sickness, (especially car and sea sickness) and also in vomiting of pregnancy. They have no place in the management of bronchial asthma, common cold and acute nephritis.

As Robson (1950) has suggested the future of antihistamines may lie in making better use of available drugs. However, search for better drugs continues. The addition of Dramamine with marked effect in travel sickness and vomiting of pregnancy is welcome. Histantine, a chlorocylizine compound with prolonged action, fewer side effects and a distinctive chemical formula may pave the way for better compounds.

It must be remembered that antihistamine drugs are at best palliative. Desensitization procedures give lasting results. It will be appreciated that antihistamines are most effective in lesions where vascular phenomena in the skin or mucous membrane are most marked. They are ineffective in 'deep seated' allergy. The probable explanation may be had in the recent suggestion of Sir Henry Dale that there are two types of histamines, 'intrinsic' and 'extrinsic', the antihistamines being more effective against the former.

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DIAGNOSIS OF HEART DISEASE

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The subject could be discussed from two different angles. One, in those where a diagnosis of heart disease is made on equivocal or insufficient grounds, and the other, though occurring less frequently, where the existence of heart disease is not recognised or suspected, because certain routine precautions are not taken during examination.

Heart disease is not the same thing as heart failure. Heart disease may be present without symptoms which begin to appear only when there is failure. Hypertension may be present for many years, before it gives rise to hypertensive heart disease which again gives rise to failure much later. In other cases, as in coronary heart diseases, only the symptoms reveal the existence of the condition. As such, in the diagnosis of heart diseases, the question of evidence of heart failure must also be taken into consideration.

GENERAL REMARKS

Before the routine methods are discussed, a few general remarks are necessary.

(A) The role of psychosomatic medicine is perhaps nowhere so eminently displayed as in cardiovascular conditions. Psychosomatic, of course, means both mental and physical counterparts of a malady. Fear of sudden death is so intimately associated with the idea of some sort of heart disease and because its consequences are not readily visible any likely symptom is so quickly translated into imaginary sequences that a patient is very commonly apt to give vent to his/her emotional conflicts in the form of symptoms. It is, therefore, very important to go into the mental make-up in the set of his/her social surroundings, in the evaluation of the presenting symptoms.

It should also be remembered that a person with definite organic heart disease may have many marked functional symptoms grafted on to it, so as to even almost mask the organic part. These are naturally the cases where most unfortunate mistakes are likely to occur.

(B) *Question of ætiology*—The diagnosis of heart diseases should not be considered complete without a knowledge of ætiology. Not only because it gives one a better idea of the prognosis but also helps to institute proper therapy and in some cases to bring about a complete cure. The common ætiological factors in the production of heart diseases are: (1) hypertension, (2) coronary heart disease, (3) rheumatic heart disease, (4) congenital heart disease, (5) syphilitic heart disease, (6) pulmonary heart disease, (7) a multiple group of cases such as epidemic dropsy, anæmia, thyroid heart diseases and similar other less common conditions, and (8) an indeterminate group.

The ætiological agents had been deliberately mentioned at this stage, because it is felt that in the diagnosis of the structural change the ætiological agent must go side by side and a brief idea of the factor should always be kept in mind while either taking the history or collecting the clinical findings. This will enable one to refrain from using such vague expressions as 'weak heart' or 'myocardial damage,' etc.

It is also necessary to know in what forms these ætiological agents commonly produce clinically detectable gross changes. This knowledge is considered essential, otherwise, one is likely to proceed with unnecessary investigations. One commonly finds a W.R. of blood has already been done in cases of hypertension; or in a case of aortic regurgitation in a young individual or in cases of vague symptoms in the chest.

Hypertension would last for many years before it would give rise to heart disease and when it does so the size of the heart is enlarged and evidence of left ventricular failure ultimately supervenes. Commonly, evidences of failure are the first symptoms that bring the patient to the doctor, and the enlarged heart and the high B. P. may be detected for the first time.

Coronary heart disease which has no invariable causal relation with hypertension produces, angina pectoris, coronary failure and coronary thrombosis; these, however, have nothing to do with syphilitic infections except under the rarest of circumstances.

Rheumatic fever may leave, as sequelæ commonly mitral stenosis and regurgitation and aortic regurgitation and stenosis and not infrequently tricuspid valve disease.

Syphilitic heart disease is rare and the common varieties due to it are aortic regurgitation and aortic aneurysm; it rarely produces a narrowing of the mouth of the coronary artery and consequent angina.

Pulmonary heart disease, contrary to what is generally believed, is quite common and is due to long-standing chronic bronchitis, asthma and emphysema. There is enlargement of the right side of the heart and then finally evidence of right-sided failure. Sometimes it is difficult, because of the concomitant emphysema and pulmonary signs, to detect the heart disease, as such only recognition of evidences of failure would indicate the presence of heart disease.

Anæmia, epidemic dropsy, thyroid conditions, avitaminosis, etc., do not produce any primary organic valvular damage and must be taken into account while heart disease without valvular lesions is diagnosed; in this connection one must remember the coronary group which sometimes produces gross cardiac changes without any acute episode, such as angina or thrombosis. The ætiological diagnosis of this type should, however, be very infrequently made.

In the diagnosis of heart disease one, therefore, should evaluate the symptoms and signs and should establish either presence of valvular diseases or enlargement of the size of the heart or evidences that the coronary arteries are deficient or a congenital condition is present. There are occasions where the change in the cardiac efficiency is brought on not by these but by a change in the rate and rhythm of the pulse in various ways.

Clinical Approach

Equipped with this preliminary knowledge one proceeds to investigate a case in the time-honoured way, namely history taking, inspection, palpation, percussion, auscultation, fluoroscopy and sometimes electrocardiography and other investigations. If one follows these ideas and simple clinical methods one shall be able to introduce almost a mathematical precision in the diagnosis of common heart conditions and which shall have lost all its intricacy from the bewildering mind.

Only those points that are considered common and important will be dealt with and that will necessarily leave many others untouched. This by no means is intended to produce the impression that those left uncovered are of no value.

History: A good history, in the majority of the cases, is more than half the diagnosis and sometimes the only clue to it. The very first symptom is always important and should be gone into in detail. Patients come to the doctors with certain symptoms and their proper evaluation in the light of accepted knowledge is the first thing in the diagnosis.

Very often one is asked to avoid asking direct questions. This attitude is not always correct. A negative reply often has a positive bearing. In chronic cough one would like to know and should ask whether there has been hæmoptysis; similarly, in heart cases when the history given is vague, one should ask direct questions in terms of the established nature of the important symptoms of organic heart disease.

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SYMPTOMS: The common symptoms are:

(1) *Difficulty in breathing*—Cause is congestion in lungs when left side of the heart fails to remove sufficient quantity of blood that is being pushed in the lungs by the right ventricle; naturally, therefore, this is the commonest symptom when the left ventricle is primarily diseased as happens mainly in hypertensive heart disease, aortic valvular diseases, coronary heart diseases and also in mitral valvular diseases. The characteristics of cardiac dyspnœa are the following: (1) to start with it has a definite and direct relation to exertion; (ii) as the disease advances the difficulty may be experienced at rest and the patient is obliged to take up a sitting posture for relief (orthopnœa). The dyspnœa may come at night when the patient has been fast asleep and experiences difficulty in breathing of various intensity. When not controlled, it recurs night after night. This has been called cardiac asthma, because, when examined during an attack the auscultatory signs in the lungs simulate an attack of bronchial asthma. Sometimes the nocturnal difficulty is experienced as only fits of cough, even simple insomnia and a vague distress over the chest. It is important to realise that at this stage there may be no objective physical signs in the lungs. Moist sounds at the bases appear much later. These patients again may be all right during the day attending to their normal vocation. On the other hand, dyspnœa unrelated or periodically related to exertion and particularly with a sighing respiration is an evidence of cardiac neurosis. It is, of course, well known that dyspnœa on exertion is also common in other gross pulmonary diseases such as, emphysema, effusion, slow pneumothorax, chronic bronchitis, etc. Anæmia and obesity would also produce a similar symptom. It is not difficult to exclude these on clinical examination. During an acute attack it may be very difficult to distinguish cardiac asthma from bronchial asthma. Past history, level and rise of B. P., circulation time and later presence or absence of cardiac pathology would help in this respect.

(2) *Sighing*—It is frequently regarded by patients as an evidence of some kind of heart disease, and is quite commonly described by the patient as a shortness of breath. Its presence is invariably due to neurosis, but very rarely it may have been grafted over an organic condition and should be carefully gone into also from that point of view. Weakness is a symptom very rarely mentioned by an organic cardiac patient. Sense of exhaustion complained of by a patient is not due to tired heart but tired nerves.

(3) *Pain*—Pain due to heart disease is invariably due to some coronary pathology and very rarely due to pericardial involvement.

Coronary pains—only clinical evidence of coronary heart diseases—may take three different clinical forms —(A) Angina pectoris (B) Coronary failure, and (C) Coronary thrombosis. The pain is typically behind the sternum and not over the region of the apex of the heart. It may, however, be present slightly to the left of the sternum over the 2nd and 3rd intercostal space. The pain of angina is related and proportional to exertion. A severe pain behind the sternum lasting for more than ½ hour in a likely subject should be regarded as due to coronary disease, invariably thrombosis. In what is called coronary failure one finds all the symptoms of coronary thrombosis but the evidences of infarction, such as drop of B. P., elevation of temperature, leucocytosis, increased sedimentation rate and characteristic E. C. G. findings are not found. Other classical features of the pain such as distribution along the arm may be complained of, in the absence of coronary disease, and sometimes as a psychological expression of a past knowledge.

A true coronary pain may, however, be related to food and felt over the epigastrium and lower end of the sternum. Sometimes the pain is described as a sense of oppression and even as a vague discomfort. One should be prepared to make a diagnosis of angina pectoris on the history alone as commonly no objective signs are detectable. However, the common causes of precordial and, for the matter of that, chest pain is due to non-cardiac condition and mainly due to neurosis. Though the commonest age group in coronary disease is between 55 and 65,—the range varies from 35 to 75.

(4) *Fainting attacks and giddiness* may be due to heart condition as in Stokes-Adams syndrome, paroxysmal tachycardia or marked aortic stenosis. In nine out of ten cases this symptom, however, is due to non-cardiac condition such as general weakness, mental, gastric or aural factors.

(5) *Palpitation* by itself should not be regarded as an evidence of heart disease. It is experienced when there is either quick and forceful beating of the heart or some type of arrhythmia. The commonest form of arrhythmia is extrasystole which by itself should be regarded as a benign condition. Palpitation may, however, be due to, paroxysmal tachycardia, fibrillation or flutter. Paroxysmal tachycardia must be thought of when the palpitation comes on suddenly and stops equally suddenly.

In this respect the condition of thyroid should always be investigated.

EXAMINATION: (1) *Inspection*—Œdema: Of the signs, œdema of the legs is commonly and truly regarded as a sign of heart disease, but at the same time it should be remembered that malnutrition, anæmia, obesity and prolonged standing posture, particularly in persons of sedentary habits, are very frequent causes of œdema of the ankles. and these latter are the types of persons who frequently complain of dsypnœa on exertion, not because of heart disease but because of the fact that they are obliged to carry an unnecessary load, their superfluous body weight.

Œdema due to cardiac failure developing at a time when the patient was obliged to stay in bed, naturally appears not on the ankles but over the sacral region, then the most dependant part.

It should also be remembered that in left ventricular failure, œdema of the legs may occasionally antedate any manifest pulmonary congestion and in such cases hypoproteinæmia is a frequent associated factor.

Œdema of the face is uncommon in cardiac failure even when there is general anasarca.

Engorged neck veins to be pathological should be bilateral (unless there is any anatomical abnormality) and above the level of the right auricle, which clinically may be regarded as the same as the junction of the manubrium and body of the sternum. This should be observed by elevating the head of the patient and observing the upper line of fulness of the vein in the neck. Measuring the height of the engorged vein from the clavicle irrespective of the position of the neck is obviously fallacious and should be discarded. Engorgement of the veins of the neck seen only during forced expiration is primarily due to pulmonary factor and not cardiac.

(2) *Palpation*—Palpation is by far the best single clinical method of finding the position of the apex and naturally the size of the heart. An enlarged heart is a diseased heart, the converse, however, is not true. The practice of turning the patient to the left and then finding the position of the apical impulse appears fallacious as far as the position of the apex is concerned because the position shifts considerably in many cases on adopting the procedure. One may ask the patient to bend forward at the end of a forced expiration and then try to find the apical impulse when it cannot be palpated in the ordinary way. Though in the majority of cases the maximum impulse is the outmost and also lowermost, occasionally it may not be so, as in right ventricular hypertrophy when the maximum impulse is provided by right ventricle and not the apex. The leftmost and outermost area of a definitely palpable impulse should be regarded as the position of the apex.

A basal thrill systolic or diastolic may be missed unless the posture just mentioned is adopted as a routine procedure. A forceful apical impulse sometimes gives the impression of a systolic thrill; a good working plan is to consider a thrill not present when there is any doubt about its existence.

(3) *Percussion*—It helps to corroborate the findings already obtained and particularly in the knowledge of pulmonary pathology.

(4) *Auscultation*—An apical systolic murmur is not to be regarded as pathological unless a varying combination of the following is also present; conduction of the murmur towards the axilla (that is the same thing as the roughness and degree of its intensity), a systolic thrill, enlargement of the heart and in the case of a child a past history of rheumatic fever.

Systolic murmur at the base when accompanied with thrill should be regarded as pathological, when without a thrill but heard well also in a sitting posture should also be similarly evaluated. Many so-called functional systolic murmurs may be due to congenital conditions and the possibility of this should always be remembered.

Diastolic murmurs should always be regarded as pathological, a basal one may be heard at times in one position, either lying or sitting up; therefore, auscultation in these postures should be a routine procedure. Many diastolic murmurs of mitral stenosis, particularly in its earlier stages, are brought out by subjecting the patient to a mild exercise and listening over the apex while the patient lies on his left. Majority of cases of heart disease is however found without a murmur. Splitting of sounds by itself is no evidence of an organic disease nor is an extrasystole.

(5) *Blood Pressure*—Normal blood pressure level is not a line but a wide range. Normally systolic level may be anywhere between 100 and 145 and the diastolic between 60 and 90. Whether sitting or lying down the patient must be comfortable while the pressure is being taken. The arm should be bared to avoid constriction by the garment and the cuff should be wrapped closely and evenly. The common belief regarding its relation to age does not usually work. Increase in systolic pressure only may be a temporary phenomenon due to non-cardiac condition Nervousness frequently increases the systolic reading by as much as 10—20 mm. of mecury. Blood pressure should be taken at least three times and the mean accepted. Sometimes it is necessary to wait for half an hour before the correct reading is obtained. Even when there is persistent hypertension, it does not necessarily bring on heart disease, which is a definite but different clinical sequel. Hypotension due to heart condition is found in coronary heart disease and in this respect a relative lowering of the level from a known height is more important than the absolute level. Many normal and active people have a permanent systolic pressure very near hundred mm. of mercury and naturally do not require any treatment. Hypotension as a diseased state is rare.

Heart disease and heart failure are not synonymous, Evidence of the former is found in the heart whereas those of the latter invariably outside it

(6) *Fluoroscopy and E. C. G.*—Fluoroscopy is a very useful aid in the determination of the size of the heart and of its different chambers and the great vessels. It is particularly useful in congenital heart disease. In many cases presence of heart disease and particularly its exact nature will be missed unless fluoroscopic examination is made.

Electrocardiographic examination is particularly helpful when coronary arterial disease specially thrombosis is suspected; its value naturally is enchanced in atypical cases. It reveals the true nature of any arrhythmia unequivocally and so also of any conduction

defect. It should, however, be remembered that gross heart disease may be present when the E.C.G. is normal and abnormal E.C.G. may be found in what, for all practical purposes, is a normal heart; the reason is due to the very nature of the electrophysical method of its production.

A normal E.C.G. may be defined as the "average type of curve" with considerable room for deviation; moreover, abnormalities may appear as a result of the lie of the heart, œdema, exercise, tachycardia, drugs and other non-cardiac conditions. Interpretation must, therefore, be made cautiously and with full knowledge of the clinical condition of the patient; furthermore, it is equally important to realise when an E.C.G. is likely to provide evidence of additional importance and then to demand one.

SPECIAL ARTICLE

SENILE HYPERTROPHY OF THE PROSTATE

With a Report of 42 Prostatectomies

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P. L. Sarma Hospital, Meerut

Senile hypertrophy of the prostate gland is the commonest cause of bladder neck obstruction in the aged. Prostatic enlargement is one of the best examples of a disease process with a very well-defined age incidence. It was long ago when Sir Benjamin Brodie described this condition in a very fascinating way; "when hairs become grey and thin, when atheromatous deposits invade the arterial walls, when there is formed a white zone round the cornea, at the same time ordinarily—I dare say invariably—the prostate increases in volume." Truth of this aphorism is so well illustrated. Hypertrophy of the prostate is essentially a disease of old age. Trivedi (1950) in an analysis of 74 cases showed that only 10·8 per cent cases were below 50 years of age, the maximum incidence of 37·8 per cent in his series was between 50 and 59 years of age, closely followed by 35·2 per cent in the 60 to 69 age group. Thus the majority of cases were in 50 to 69 years of age group. Sen (1949) analysing 1,189 cases of prostatic obstruction has shown that the maximum number was between 66 and 70 years of age. The series which the author intends to review in this paper, shows a maximum incidence between 60 and 69 years of age with one case as early as 50 years.

In this paper other conditions such as muscular or fibrous median bar obstruction, carcinoma of the prostate or prostatic fibrosis will not be discussed.

ÆTIOLOGY

The ætiology has long been a subject of debate. The pendulum of opinion has swung from chronic inflammation to an endocrine disturbance. In the past, attempts have been made to prove a relationship between chronic gonorrhœa and prostatic hypertrophy but evidence has been too flimsy to tarnish the character of these old gentlemen. The neoplastic theory postulates that the enlargement is of the nature of a benign neoplasm. The association of the condition invariably with the advancing age suggests a strong relationship with testicular hormone. It has been supposed to be due to an increase in the œstrogens and a diminution in the androgens. This view has some degree of experimental background. In experimental animals synthetic testicular hormones inhibit prostatic hypertrophy which is produced by the pituitary hormone. The view at present held seems to be that the prostatic hypertrophy is a sort of male climacteric as described by Kenneth Walker with hormonal imbalance and metabolic disturbances.

PATHOLOGY

The enlargement is due to formation of one or more fibromyo-adenomatous growths, the mass enlarging at the expense of the gland substance which it pushes outwards to the periphery forming a compressed capsule termed as the false capsule from inside which the adenoma can be easily shelled out. The usual site of hypertrophy is the wedge of gland between the urethra and the ejaculatory ducts, thus forming the middle lobe. The lateral lobes are equally involved in the hypertrophy though the posterior lobe remains unaffected.

The effects of enlargement on the urethra, bladder and kidneys are marked. The part of the urethra above verumontanum is elongated, becomes tortuous and compressed. The bladder is not completely evacuated for obvious reasons by the ball-valve action of an enlarged middle lobe in some cases but in the majority due to an elevation of the internal urinary meatus resulting from an upward growth of the gland in the floor of the bladder. The enlarging mass of the gland occasionally dilates the internal sphincter to the extent of rendering it incompetent with the resulting urinary incontinence. The tank is never empty, when the urine reaches above the level of outlet it simply pours out. Thus, there is a large amount of residual urine which get stagnated and infected. The muscular wall of the bladder gets hypertrophied, trabeculated, and later on sacculations and pouches form into false diverticulæ. Kidneys suffer from back pressure and infection results in ascending pyelonephritis. This train of events damages renal functions to varying degrees. The symptom complex arising from enlarged prostate is the result of urinary obstruction, infection and kidney damage—all set up in a vicious circle.

TREATMENT

Hormone therapy has little use if any in the treatment of an enlarged prostate; there is some evidence to show that in early cases it may be of some relief. Removal of the enlarged gland is the only effective

method of dealing with it. Since long a lively interest has centred round the merits and demerits of various operations of removing the enlarged prostate. There still seems little agreement as to what is the best method of performing a prostatectomy. There is so much diversity of opinion among surgeons that at times it becomes difficult to form a well balanced opinion regarding the merits of different methods. In the present paper will be given only a passing review of the various methods of operation and some details of the method and plan of treatment adopted by the author in his series of cases. These seem quite suited for the hospitals in India.

An enlarged prostate can be dealt with by suprapubic, subpubic, perineal or transurethral routes.

When Freyer introduced his method of suprapubic prostatectomy, it was considered to be a hazardous procedure owing to the high rate of mortality that was usual with it. The dangers were of hæmorrhage and shock, infection and secondarily the prolonged recumbency in bed of these old people was frought with grave consequences, thus further increasing an overall rate of mortality. Thomson Walker made a few modifications which helped in better and immediate hæmostasis, this method was later on further improved by Harris of Australia in 1934 who incorporated certain steps which claimed to attain greater perfection in both immediate and later results. These steps were, control of bleeding by hæmostatic sutures, reformation of prostatic urethra, and immediate closure of the bladder and abdomen wounds.

Perineal prostatectomy as advocated and practised by Young of Baltimore, has not been taken up by many either in U. K. or in this country, though it has been a much followed procedure in the States. In the very aged with bronchitic complications, or where a malignancy is suspected, or in fat people, it has definite advantages. Lately, Kaikini (1951) has published a report on prostatectomy by this method with encouraging results.

Transurethral resection prostatectomy when first introduced in 1931, was welcomed by the surgical profession and many thought that a millenium has arrived in prostatic surgery, but despite many ingenious improvements in its armamentarium it has not been able to meet many of its drawbacks. The bulk of evidence now favours transurethral piecemeal prostatectomy in relatively small fibrotic type of enlargement, and as a palliative to give relief in operable cases.

The whole perspective of prostatectomy changed in 1945, when Terrance Millin of All Saints Hospital, London, sponsored his new technique of retropubic approach of the prostate. This has been claimed to possess outstanding advantages of low mortality, less shock, immediate hæmostasis, less danger of bladder fistula, no danger of postoperative obstruction, and last of all quick healing. But its drawbacks of being a technically more difficult operation, requiring some special instruments and equipment, secondly, of not having any provision for a two-stage operation, are such that it cannot be suited for the majority of our cases. Millin (1947) has put down a mortality of 1·5 per cent for his operation, and 8 per cent for a two-stage operation and 4 per cent for transurethral resection.

Wilson Hey (1946) has lately advocated his one-stage aseptic prostatectomy. He is convinced that the dangers of prostratectomy are enormously diminished when strict asepsis is maintained, no catheterisation is done and the one-stage operation practised even in acute retention.

Alcorta of Beunos Aires published an operation identical to that of Heys. The bleeding from prostatic cavity after enucleation is controlled by diathermy electrode.

Among the host of operations for enlarged prostate one has to select the one best suited for his patient in the particular surroundings in which he is working and the facilities and skill at his disposal.

The age old Freyer's suprapubic prostatectomy in two stages, has so successfully resisted the challenges thrown out by these other methods that this claims to hold the monopoly of being called a most valuable method in the majority of cases of senile hypertrophy of the prostate. It is simple, safe and suited for general hospitals. No special technique or instruments are needed, and when done in a "modern setting", it definitely gives a reasonably low rate of mortality. The state of renal impairment and presence of urosepsis, which majority of our cases present, render prostatectomy a hazardous procedure, and therefore the patient and his renal tract must be suitably overhauled before any attempt is made to remove the prostate. The two-stage prostatectomy is the only answer to this problem.

A preliminary thorough investigation of renal functions is absolutely essential. A blood urea estimation, urine culture, cystoscopy, chromocystoscopy, and a descending peylogram are all very important.

Analysis and Plan of Treatment of Cases Under Review

Between June 1950 to December 1951, the author had the opportunity of dealing with 80 cases of senile hypertrophy of the prostate gland, as shown in Table I below.

Age Incidence:

Table I—Showing Age Incidence

Age group	*No. of cases*
Below 50 years	1
Between 50—59 years	25
Between 60—69 years	40
Between 70—79 years	12
80 years and above	2
Total ...	80

Thus, it can be seen that the maximum incidence is between 60 to 69 years age group. One case was below 50 years.

LEADING SYMPTOMS: The leading symptom for which these patients usually come is urinary obstruction in some form or other. A small percentage of cases had no obstructive symptom but the main trouble was either hæmaturia or frequency or incontinence or dysuria. Table 2 gives an analysis of chief symptoms.

TABLE 2—SHOWING ANALYSIS OF SYMPTOMS

Symptoms	*No. cases*
Frequency of urination	72
Repeated urinary obstruction	46
Acute urinary obstruction	4
Dysuria	4
Incontinence	8
Hæmaturia	3
Abnormal sexual disturbance	Nil

The most usual case comes up with history of frequency of micturition and who has had a few attacks of obstruction, and these obstructions were relieved on previous occasions by a catheter by some local doctor. Thus, the majority of cases come where infection in the urinary tract already exists. It is rather surprising that not a single case in my series gave history of any sort of abnormal sexual feelings; may be, they hide this side of the picture due to mere shyness. 68 out of 80 cases were clinically showing evidence of renal damage in some degree or the other; like lack of mental alertness, dry tongue, headaches, dry skin, etc. Thus, these 85 per cent cases are such where obstruction and infection have already wrought gross damage to the kidneys and need careful rehabilitation before any prostate surgery can be done. This particular feature the author would like to emphasise because while choosing a method of prostatectomy which may be suited to the majority of the cases, it is of foremost consideration.

Keeping in view, the type of cases that one gets usually and the facilities of work available, a two-stage Freyer's suprapubic prostatectomy was thought to be most suited for the routine work.

42 prostatectomies have been done with three fatalities. Thus, the overall mortality rate is about 7·1 per cent. Beelow is given in brief the plan of treatment followed and the analysis of the cases operated on:

After the diagnosis is established by the routine clinical, rectal, bougie and endoscopic examinations, a blood urea estimation is done on those who are willing for an operation and a first-stage suprapubic drainage of the bladder is done. A high suprapubic is the aim, as it avoids adhesion formations in the cave of Retzius which later on present difficulty in reaching inside the bladder at the second stage. The bladder is drained by a self-retaining catheter. Draining the bladder by indwelling rubber catheter has not proved a success with the author. During this period when the patient is draining suprapubically, his general condition improves, mental outlook brightens up, the tongue becomes moist, appetite improves and on the whole there is a general improvement in his 'renal health'. Blood urea is again estimated and a lowering is noted in those where it was raised in the beginning. In this connection one would like to impress that cases have been seen in this series where clinical signs of kidney damage were definitely present and which improved by a period of suprapubic drainage of the bladder but in whom there was no appreciable rise in the blood urea in the beginning. Early ambulation is insisted on during this period of suprapubic drainage. The patient is asked to do leg exercises just after the operation and allowed to get up in the wheeled chair the next day with a stopcock at the end of the self-retaining catheter. Plenty of bland fluids is given by mouth, but no bladder washes. Those who are running temperature are treated with sulphadiazine 1 gm. t.d.s. for 4 days, and streptomycin ½ gm. b.d. for 4 days. It is found that this routine helps a great deal in combating urinary infection and assisting the kidneys to regain their functions early.

The usual time taken for the patient to become fit for a second stage operation is about 10 to 18 days, but this recovery may take longer time in cases with severe kidney damage. In one case of the present series, it took 40 days. Here again, this interval between the first and second stage is not to be laid down in number of days; it will be as short or as long as the patient takes to improve his kidney function which has been damaged by obstruction and infection, and the criterion of its returning to normality are, mental alertness, moist tongue, good appetite and fall in blood urea level. This may take a week or a couple of months.

The second stage of enucleation is performed at a desired time. An ungloved left index finger does the job of enucleation very well, the mucous membrane inside the prostatic urethra is split and enucleation is done in the proper line of cleavage. A finger in the rectum passed by an assistant helps to steady the prostate during the process of dissection. Fibrotic type of prostates gives some trouble in removal. Hæmorrhage has not been of much significance in any of the cases. A hot bladder irrigation after the removal of prostate acts well in stopping the hæmorrhage and also helps in removing loose tags of mucous membrane and prostatic tissue, and blood clots. If the ooze is excessive, a gelfoam or spongostan pack put in the prostatic cavity works very well. The prostatic cavity should never be packed by a gauze roll. The author has not used a Foleys catheter nor has he felt any need for it so far. Occasionally, there may be a slight blood-stained urine for 24 to 48 hours but that stops by itself, and need not be worried about. Hæmorrhage in a two-stage prostatectomy is definitely less.

Two pints of glucose saline by an intravenous drip are run after the operation, slowly with an injection of

1/100 grain of atropine: after which continuous rectal saline for the next 24 hours is given and fluids in every form by mouth are encouraged. For pain and restlessness during first 24 hours and later on, if needed, morphine or pethidine is used. The self-retaining catheter is removed after 6 or 7 days, this early removal allows the suprapubic wound to close rapidly.

As after the first stage, the leg movements must be started within just a few hours after operation and the patient is made to sit on the next morning and allowed to hang his legs from the bedside in the evening and finally wheeled in a chair the following day. This procedure of graduated and early ambulation definitely checks many of those pulmonary and pelvic complications which might otherwise jeopardise an old man's recovery after the operation.

Penicillin is given as a routine for 4 days after the second stage operation. In a few cases where the temperature persists streptomycin ½ gm. b.d. for three days has proved a real good measure. Every case is given plentiful of fluids by mouth but no bladder irrigations; when phosphatic deposits delay the healing of the suprapubic wound, the pH of the urine requires to be changed by giving acid sodium phosphate and hexamine by mouth for a few days with very good results.

The suprapubic wound usually heals in three weeks time. Much depends on the general vitality of the patient. Eight weeks has been the maximum time of healing in the series under review. No case of persistent suprapubic fistula has been recorded. On the tenth day of operation an urethral bougie has been passed in every case. It helps in avoiding formations of post-operative stricture or diaphragm formation. Micturition usually commences from the 10th to 13th day. No case of post-operative epididymo-orchitis has been met with though no pre-operative vasoligation was done in any of the cases.

COMPLICATIONS: *Hæmorrhage*—In none of the cases under review did it so happen that it could not be controlled with a small gelfoam of spongostan pack in the prostatic cavity after the second stage. Gauze roll packing of the cavity has not been done on any occasion. It leads to infection.

Infection—With the free use of antibiotics no such occasion arose where it could not be controlled.

Lung complications—Hypostatic pneumonia has been seen in two cases, and a small pulmonary infarction in one. All these were after the second stage operation.

Operative shock—In very old and feeble subjects the second-stage operation sometmes gives rise to an unusual degree of shock, but it is rare The author had one case like this who succumbed as a result of it.

Renal failure—In properly timed selected cases it does not occur. It is preventable. If it sets in, 4 per cent sodium sulphate soluion I.V. by drip method is most useful. In the series under review it occurred in one case.

Persistent suprapubic fistula—It is the result of infection, adhesion of the bladder to underlying symphysis pubis, excessive scarring, etc. The author has not encountered it in any of the operated cases.

Obstruction—A few cases might complain of some degree of obstruction persisting after the operation; this is due to infection in the prostatic bed leading to some sort of diaphragm formation. It is overcome by a few sittings of urethral dilatations.

TABLE 3—SHOWING ANALYSIS OF 42 PROSTATECTOMIES (SUPRAPUBIC ENUCLEATION)

Serial No.	*Age in years*	*Blood urea in mgm.*	*Time (in days) elapsed between 1st and 2nd stage operations*	*Day on which suprapubic wound closed after 2nd stage*	*Total stay (in days) in the hospital*	*Result*
1	60	38	14	22	40	Cured
2	58	42	18	21	44	Cured
3	58	25	14	31	50	Cured
4	65	33	26	26	60	Cured
5	66	54	24	24	52	Cured
6	73	48	16	—	—	Died
7	70	39	12	25	38	Cured
8	69	56	17	22	42	Cured
9	61	40	14	22	39	Cured
10	62	44	16	28	50	Cured
11	64	102	40	36	77	Cured
12	56	54	18	22	44	Cured
13	58	27	12	19	32	Cured
14	60	43	10	21	33	Cured
15	72	60	21	—	—	Died
16	58	54	14	17	34	Cured
17	65	54	16	22	40	Cured
18	63	29	13	32	50	Cured
19	60	52	17	42	65	Cured
20	64	48	15	22	40	Cured
21	60	72	20	22	50	Cured
22	60	44	12	19	34	Cured
23	68	48	13	27	44	Cured
24	70	52	22	32	60	Cured
25	65	33	16	24	44	Cured
26	60	28	12	—	—	Died
27	78	44	14	29	55	Cured
28	58	38	17	24	44	Cured
29	61	44	18	35	60	Cured
30	68	58	15	23	60	Cured
31	60	38	15	21	43	Cured
32	59	34	13	22	40	Cured
33	63	56	14	20	40	Cured
34	67	46	16	18	41	Cured
35	59	40	15	19	37	Cured
36	62	32	14	20	38	Cured
37	65	46	19	23	45	Cured
38	56	42	18	24	42	Cured
39	60	40	16	20	43	Cured
40	61	28	15	29	48	Cured
41	55	30	14	18	40	Cured
42	67	62	28	30	70	Cured

Mortality—Out of 42 prostatectomies, 3 deaths were recorded, i.e., 7·1 per cent.

Cause of death was operation shock in one case, renal failure in one and hyperpyrexia in one case.

Average stay in the hospital comes to about 49·9 days, this includes the total period.

Postoperative Obstruction in urinary flow was complained of in 5 cases, this condition was cured after 2 to 3 dilatations.

Summary

A brief review of incidence and pathology of senile hypertrophy of the prostate gland has been given.

A short outline of various methods of prostatectomy has been presented along with the details of Freyer's two-stage suprapubic prostatectomy, which the writer has adopted in the present series of cases.

An attempt has been made to evaluate this classical method of prostatectomy, which when done in the modern settings and under the antibiotic umbrella, is an easy and safe way of dealing with the majority of cases of patients of senile prostatic hypertrophy; the two-stage operation is an answer to many of the underlying hazards of prostatectomy.

42 prostatectomies have been analysed.

A death rate of 7·1 per cent has been reported.

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PUBLIC HEALTH

DIAGNOSTIC AIDS IN MASS TREATMENT CAMPAIGNS AGAINST YAWS*

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It is generally agreed that the serologic laboratory can and should play an important role in mass treatment campaign against yaws. The decision as to when routine serologic testing should be performed, which serologic procedure should be employed, and the frequency and duration of serologic examinations after treatment will depend on many factors which include, adequacy of laboratory facilities, availability of trained personnel, climate, geography, customs, mores, cooperation of local and international health authorities, and many other conditions which may vary in different areas of the world. Unfortunately, the facilities for satisfactory serodiagnosis are the least adequate in those areas where the incidence of yaws is the highest.

The ideal situation in mass treatment campaigns would be the enforcement of a house to house canvas where all individuals in a given community were subjected to a careful examination for any clinical or anamnestic evidence of yaws as well as to a serologic examination. This type of survey is often impossible, impractical or too difficult. It has been repeatedly demonstrated that if the health authorities depend on voluntary attendance, only 25 to 50 per cent of the individuals will present themselves for treatment, whereas from 80 to 90 per cent of the individuals can be examined and treated by means of a house to house canvas.

There are definite limitations of any treatment campaign based solely on clinical examinations. This method would miss those patients with no clinical manifestations who are in the incubation stage of yaws. Furthermore, it would not be possible to detect the seropositive asymptomatic latent yaws patients, who may ultimately develop cutaneous relapses thereby setting up new infectious reservoirs. Furthermore, if one depends entirely on a clinical survey, there will be included some non-treponemal disease that will respond to penicillin therapy, thereby causing a fallacious increase in cures. This type of survey would also include some non-treponemal conditions which do not respond to penicillin, resulting in a fallacious decrease in cure rates. The number of patients with non-venereal conditions subjected to penicillin therapy would depend on

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the diagnostic acumen of the clinicians. Dependence on anamnestic evidence is also fraught with difficulties. The word soon gets around among natives that they will receive some "magic medicine" if they will state that they have had yaws and this they will gladly do with the hope that it will cure their bone pains, malaise as well as many imaginary ills.

There are many limitations to a serologic survey, since a house to house serologic examination of all inhabitants would slow up the work considerably. Furthermore, the interval between serologic survey and institution of treatment would require several days and some of the individuals requiring therapy would not be available when the treatment teams revisited the houses. This type of survey would require extensive laboratory facilities to examine the large number of blood specimens and well trained serologists to evaluate the results.

Mass treatment of yaws can be carried out effectively before establishing adequate serodiagnostic facilities. It is sometimes quite impractical to await the development of modern serodiagnostic laboratories before instituting mass therapy.

As Magnuson has so well stated, the problems in combating yaws are similar to those in shooting down attacking enemy planes. "Where the sky is full of planes, our first and immediate concern is to fill the sky so full of flak that the damage the enemy can do is minimized. Under such circumstances we can be rather indiscriminate about our aim and ask only for enough people to man enough guns to fire enough ammunition in the area to shoot down the attacking force. When the number of attacking planes is small, we change our tactics. It is foolish to fill the sky with flak to shoot down one or two planes. In this instance we need precision aiming mechanics accurately controlled and well manned."

In high prevalence areas it may be feasible to treat entire populations without any regard to serologic examinations. In low prevalence areas, however, there is a great need for careful serologic examinations with tests known to have high levels of sensitivity and specificity. In those areas where the incidence of biologic false positive reactors remains constant, and the number of patients with yaws decreases, the relative proportions of biologic false positive tests will increase. Clearly, there is great need for a simple, inexpensive and yet consistently effective serodiagnostic procedure in low prevalence and under-developed areas with inadequate laboratory facilities and insufficient trained technicians. To date, the filter paper method and the various modifications of the Chediak reaction have not been proven to the standard tube or slide tests performed on serums. In the experience of Rein and Le Moine, 1934), the use of capillary tubes for collection of specimens have been found to be satisfactory in the United States, but this would not be a practical approach to the yaws problem because of the lack of laboratory facilities and trained personnel.

The first phase of a mass treatment programme, therefore, is the development of plans of operation. The laboratory aspects must be considered from two points of view, the mass group and the pilot group. If serodiagnostic procedures are to be employed for the mass group, there must be a careful selection as to the type and sensitivity of the test dependent upon certain factors:

(*a*) Method of obtaining blood specimens. If it appears that the only feasible means of collecting blood is by finger puncture, it would be necessary to utilize a filter paper method, a modification of the Chediak test, or the capillary tube technique.

(*b*) Sensitivity level. Make use of the most sensitive test possible, without decreasing its inherent specificity level as a screening procedure. The seropositive reactors can then be carefully examined and questioned for any clinical or anamnestic evidence of yaws.

Limitations of Mass Serologic Surveys

(*a*) *False negative reactions*—Negative serologic reactions are to be expected during the incubation period of the disease. This seronegative phase may persist for six weeks or longer after exposure to infectious yaws. The duration of this seronegative phase will depend on several factors, including the size of the infectious inoculum, thee patients' individual immune response, as well as the sensitivity and the type of the test employed. There is some evidence to indicate that in early yaws certain tests of the complement-fixation type may become positive before some of the tube and slide flocculation procedures. Seronegative yaws may be due to a number of factors, as (1) the amount of circulating antibody is minimal and cannot be detected by tests with ordinary sensitivity; (2) the presence of too much antibody so that negative zone reactions occur; (3) the use of serologic tests with low levels of sensitivity; (4) the use of fresh serum containing considerable amounts of thermolabile-inhibiting substances, and (5) the presence of a thermostabile-inhibiting substance in the albumin fraction of the serum.

It should also be pointed out that true negative reactions may be obtained in non-treponemal conditions which may simulate yaws, such as impetigo, tropical ulcer, purulent skin infections and traumatic or occupational palmar and plantar hyperkeratosis. Patients with vague joint pains, malaise and other symptoms of non-treponemal ætiology may also present themselves for serologic examination and treatment.

(*b*) *False positive reactions*—While it is true that most positive serologic reactions obtained with our current nonspecific lipoid antigens are due to treponemal diseases and perhaps represent some type of immunologic response, it is no less true that some positive results are unrelated to yaws and represent a general biologic phenomenon. Such false positive reactions may be

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caused by a variety of infectious diseases and metabolic disturbances and may be due to (1) the presence of antibody-like substances similar to the antibodies produced in treponemal diseases; (2) an alteration of the seroglobulin fraction or (3) an increase or alteration of some chemical substance or substances in the blood. Furthermore, technical false positive reactions may occur in serums containing no antibodies and may be due to (1) technical errors in the collection and labelling of specimens; (2) the use of unsatisfactory blood specimens (contaminated or hemolyzed); (3) errors in the performance of the serologic tests; (4) the use of faulty materials and reagents in the test or (5) errors in recording or reporting the final results. With the improvement of serologic techniques and the use of improved materials, especially purified antigens of the cardiolipin type, there has been a marked reduction in the incidence of false positive reactions.

There is still another problem that may confront the serologist in evaluating the serologic response of an adequately treated patient with yaws. Several months or even years after completion of therapy, he may develop an intercurrent non-treponemal infection which would produce biologic false positive reactions and a subsequent rise in serologic titer. Such individuals are often categorically and fallaciously classified as a serorelapse or treatment failure.

(*c*) *Seroresistance*—Positive serologic reactions may persist in arrested and burned out cases for many years and in such individuals treatment or retreatment is not indicated. In yaws, as in the other treponemal diseases, persistent positive serologic reactions does not indicate a persistent infection. A diagnosis of latent yaws should not be made on a seropositive reactor without clinical or anamnestic evidence of the disease unless it were possible to demonstrate specific antibodies by means of the Nelson treponemal immobilization or phagocytosis phenomenon. This, of course, is not practical in mass treatment campaigns, but it would be worthwhile considering in the pilot group. In the consolidation phase of the mass treatment programme the question may often arise as to the indications for retreatment based on serologic examinations. Retreatment should be instituted if there has been a sustained rise in serologic titer which may indicate either a relapse or an asymptomatic reinfection. Retreatment should not be instituted solely on the persistence of positive serologic reactions.

There are, therefore, indications for and limitations to the use of serodiagnostic procedures in treatment campaigns. Unless one is aware of the many limitations inherent in serolgic investigations, there may be many errors of omission and commission.

Functions of the Labcratory in the Pilot Group

Whether or not serodiagnostic procedures are to be employed in the mass treatment group.—It is of utmost importance to set up a well controlled laboratory in the pilot group as soon as possible and preferably before mass therapy is instituted. It is during the demonstration, survey and training phase of the programme in the pilot group that the laboratory can supply much valuable information that will be used during the expansion and consolidation phase, such as,

(*a*) Darkfield disappearance time following therapy to determine the immediate efficacy of the penicillin preparation to be employed. It should also be the function of laboratory personnel to determine the disappearance time following the use of the other antibiotics. It has been our experience that there is no appreciable difference in the darkfield disappearance time following penicillin therapy of syphilis, yaws and pinta. It is also generally agreed that the disappearance time is more rapid following penicillin than it is following aureomycin, chloromycetin, terramycin and dyhydrostreptomycin. Comparative studies of this type should be carried out in the pilot group. Any new treponemacidal drug should also be investigated for darkfield disappearance time in the pilot group.

(*b*) Quantitative serologic tests are mandatory in the pilot group in order to note the serologic trend following therapy. Progress may be considered as satisfactory as long as there is a progressive reduction in serologic titer. Short intensive methods of therapy with penicillin are terminated while the patient is still seropositive. If serologic tests are to be of any value in determining the efficacy of the therapy, quantitative procedures must be employed prior to and at three month intervals for one year following completion of therapy in the primary control area. As a minimum requirement, tests should be done at least at six and twelve months. In a recent article on studies in penicillin treatment of syphilis by Arnold *et al* (1952), they state that "In judging the success or failure of therapy, the ideal serologic follow-up of patients consists of an examination every two weeks, or at least every month, for the first 6 to 12 post-treatment months. In the evaluation of an experimental therapy, a battery of qualitative serologic tests and a quantitative test, performed regularly, is advantageous for observation. However, in a public health programme or in routine therapy utilizing a schedule known to be effective, essential information may be gained from the regular use of one qualitative and one quantitative test performed preferably with a cardiolipin-lecithin antigen."

There are several factors which influence the length of time required to attain seronegativity (Rein, 1947).

1. Stage of disease. The older the disease, the longer the spirochetes are present and the longer it takes for the body cells to stop forming antibodies. As a rule patients with secondary yaws require more time to acquire seronegativity than patients with seropositive primary lesions.

2. Immunologic response of individual patients. Some patients with yaws develop more antibodies than do others after the same type of stimulus. The former patients usually require more time to attain seronegativity.

3. Serologic titer. As a rule, patients with high serologic titers at the onset of therapy may require more time than those with relatively low titers to attain seronegativity.

4. Sensitivity of the serologic procedure. The more sensitive the serologic test, the longer it will take to attain seronegativity. When a serologic battery consisting of tests with varying sensitivities is employed, negative reactions may be obtained with the less sensitive tests long before the more sensitive tests can become negative.

5. Type of test. Certain type of tests may remain positive long after other tests have become negative, even though they may be of the same relative range of sensitivity.

It must be pointed out, however, that there are many variations to the above factors, and no set rules can be made to determine or anticipate the length of time required to attain seronegativity. The serologic response in early yaws is certainly much slower than that observed in early syphilis with similar schedules of therapy. One of the reasons for this difference may be that in syphilis, therapy is usually started within a few weeks after the development of cutaneous manifestations, whereas in yaws patients usually have their infection for many months and even years before receiving therapy. Studies carried out in the pilot group might supply information regarding the slow serologic response.

(c) *Differentiation between relapse and reinfection.* The criteria for indisputable yaws reinfections are quite rigid and unfortunately, the patients are not observed at sufficiently frequent intervals to satisfy all of the requirements. It is, therefore, often quite difficult to determine whether the patient had developed a new infection or if there has been a relapse of the old infection. From our observations in syphilis, we felt that it was possible to differentiate between relapse and reinfection by carefully conducted quantitative serologic studies at frequent intervals.

Following successful penicillin therapy in patients with early syphilis, there is usually a progressive reduction in serologic titer. In reinfection the patient usually attained and mantained complete seronegativity followed by the development of a darkfield positive, seronegative lesion at a new site. Shortly afterwards such patients developed seropositive reactions with rapidly increasing titers. In treatment failures or relapse there was noted a sudden increase in serologic titer followed in about one month by clinical evidence of a mucocutaneous relapse in the majority of instances. If penicillin treated patients would be subjected to serologic examinations at weekly or monthly intervals, it might be possible to predict a clinical relapse before there is any clinical evidence, by a progressive increase in serologic titer on repeated examinations. Such studies might be carried out in primary control areas in order to determine whether or not it is possible to differentiate between clinical relapse and clinical reinfection by means of serologic examinations.

There are various aspects of yaws that require laboratory investigations to fill in the gaps in the knowledge of this disease (Hacket, 1949; Chambers, 1950). Some of the following studies could be planned and carried out in the control group.

Do the newborn infants of seropositive mothers with yaws have positive blood tests? Are these positive reactions detected more readily with complement-fixation tests than with flocculation tests as has been observed in syphilis (Rein and Kostant, 1949)? Do these seropositive reactors, due to a passive transfer of antibodies from mother to the fœtus in utero, revert to seronegativity within the first three or four months of life as in syphilis? Is there a similar transfer of treponemal immobilizing antibodies from mother to infant and are these also of a transient nature? Do these transient treponemal immobilizing antibodies protect the newborn infant against infections with yaws? Does this yaws-toxæmia account for the observation that yaws is seldom encountered in children under six months of age even though they are in close contact with actively infected mothers?

Is the luetin reaction of any value as a diagnostic procedure? Will a new luetin prepared from tissue-free treponemes be more sensitive and more specific than the older preparations obtained from syphilitic rabbit testes? Is luetin prepared from *T. pertenue* more specific than the luetin prepared from *T. pallidum* in patient with yaws? Is there any correlation between the S.T.S. titer, T.P.I. titer and skin test reactions with various types of luetin preparations? Is there any correlation between the development of positive luetin skin reactions and the stage or duration of the yaws infection?

Is it possible to immunize individuals with a treponemal vaccine? How does the immunity which develops after naturally acquired, compare with the immunity following experimentally induced infections? How does such immunity compare with that produced by specific immunization procedures? Is there any direct correlation between the T.P.I. titer and the degree of immunity?

These and many other questions are awaiting answers, if we are to have a better understanding of yaws.

Conclusions

Modern serodiagnostic tests for syphilis, employing purified antigens are extremely valuable in pilot groups for determining the ultimate efficacy of mass treatment campaigns against yaws.

With improvement in technique and materials employed, the specificity and sensitivity of the serodiagnostic procedure has been appreciably increased.

There are certain limitations (false negative and false positive reactions) inherent in the currently em-

ployed tests. The public health worker must be aware of these limitations, for otherwise serious errors of omission and commission will be made.

It may not be feasible to perform serologic examinations and serologic follow-ups of patients treated in mass campaigns, but it is of utmost importance that carefully controlled laboratories in pilot groups be set up during the demonstration, survey and training phase. Diagnostic aids should be employed in these groups in order to predict what may be expected in the mass treatment campaigns. Furthermore, much investigative work can be carried out in these pilot or control groups to help fili in the gaps in the knowledge of yaws.

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TREATMENT SERIES

TREATMENT OF DIABETES*

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The physiological basis of the treatment of diabetes should be (1) maintenance of normal blood sugar level and (2) absence of sugar in urine. So, far as the patient is concerned the ideal treatment should be that the patient should feel fit to carry out his normal avocations of life, must not be fatigued easily, must not suffer from polyuria, polyphagia and ketosis. It is, however, difficult sometimes to give an ideal treatment which will satisfy the physiological as well as the physical ideals.

The treatment of diabetes keeping the above ideal in view may be reverted into (1) treatment of mild diabetes, (2) treatment of moderately severe diabetes and (3) treatment of diabetes with complications.

Patients suffering from mild diabetes may be cured by regulation of diet only.[1] Moderately severe diabetic cases may be treated by controlling the diets and administering large doses of vitamin C. Diabetics who may not be controlled by the above mentioned procedure and who are not suffering from any complications require treatment with insulin in addition to the control of the diet. The treatment of diabetics with complications will vary according to the nature of the complications.

DIETARY TREATMENT OF DIABETES

A diabetic like any other individual requires calories, minerals, vitamins and water as proximate principles of diet. Because the diabetic patient excretes sugar in urine it was thought logical to restrict the intake of carbohydrate whereby the loss of sugar in the urine could be counteracted. So in the earliest part of the century Naunyn thought that carbohydrates should be replaced by fats as high protein diet might produce harmful by-products, which the kidney may not eliminate. Wth a high fat diet it was possible to diminish the urinary excretion of sugar but a complication arose. Ketones were formed in excess in a high fat diet and gave rise to diabetic coma. In experiments with rats it has been found that a high fat diet leads to lowering of the insulin content of the pancreas. Therefore, in a moderately diabetic patient whose pancreas contains some islets secreting insulin if given a high fat diet will further interfere with the activity of the cells of the islets. The excessive amounts of fat result in impairment of carbohydrate tolerance. A high fat diet depletes the glycogen content of the liver cells. The fats are deposited in the liver cells in place of glycogen and as a result sugar cannot be stored in the liver as glycogen. Therefore, a high fat diet replacing carbohydrate is not desirable.

Ingestion of high amount of carbohydrate gives rise to increased excretion of sugar in urine and rise of blood sugar. A high protein and low fat diet is therefore, desirable. Before the discovery of insulin Frederic M. Allen advocated undernutrition as the treatment of diabetes. Diabetic patients with restricted caloric intake lived longer, did not develop diabetic coma but did not live like a normal person. While I was with Dr. Elliot P. Joshlin in the New England Deaconess Hospital, Boston, U.S.A., in 1945, I was shown a lady diabetic who was treated with restricted caloric intake as advocated by Dr. Allen before the invention of insulin. The lady weighed 145 lbs. when her diabetes was detected and after treatment with Allan-diet she weighed 85 pounds. As you may well imagine she was very much emaciated. After the discovery of insulin she was the first patient in the United States of America who was treated with insulin and with this treatment

* Based on a talk given at a clinical meeting of the Calcutta Branch of the Indian Medical Association on April 3, 1952.

with insulin she was given a diet with adequate calories and when I saw her in 1945 she weighed 125 pounds. Under-nutrition, therefore, should not be advocated.

The calorie requirements of a diabetic patient should be calculated as 30 calories per seer body weight. If a person weighs 1 maund and 10 seers he would require 1,500 calories. For optimum nutrition the protein content of the diet should be at least 1 gm. per seer body weight. The protein requirement of a diabetic patient of the above weight, therefore, should be at least 50 gm. To give a high protein diet this should be increased by 50 to 60 per cent. Total calorie from this 80 gm. of protein would be 320 calories. The fat content of the diet should not be more than 90 gms. If the diet contains more than 90 gms. of fat it is liable to give rise to ketosis. 90 gm. of fat would furnish 810 calories. The balance of calories should be obtained from carbohydrates. A diet consisting of 80 gm. protein, 90 gm. fat and 90 gm. carbohydrates may be obtained from the following diet:

Milk	1/2 seer
Eggs (duck's) ...	2
or	
Eggs (hen's)	3
Fish	2 chhataks.
Meat	2 ,,
Butter	1/2 chhatak
Oil	1/2 ,,
Rice or Wheat	2 chhataks

For additional supply of minerals and vitamins the following vegetables which have negligible carbohydrate, protein and fat contents should be included in the diet. These vegetables are lettuce, palang sak (spinach), naté shak (amaranth), chal kumra (white pumpkin), uchche (bitter gourd), kankur/sasha (cucumber), bandhakopi (cabbage), ful kopi (cauliflower), mula (radish), saje data (drum stick), tomato, bégun (brinjal), dhundul (vegetable marrow), patal (parbal), lau (gourd) and fruits like pati lebu (lemon) or kagji lebu (lime). In case of a vegetarian, the diet may be as follows:

Milk	1 seer
Rice or Wheat	2 chhataks
Casein	3 ,,
Oil or Butter	1/2 chhatak
Vegetables	as above.

The above diet should be evenly distributed between the three principal meals, namely breakfast, lunch and dinner. Rice in the diet may be replaced partly or wholly by 2 chhataks of wheat flour, 2 1/2 chhataks of pulses, 7 chhataks of soya bean, 7 chhataks of potatoes or 14 chhataks of carrot. All the above ingredients in the quantity suggested will furnish roughly 75 gm. of carbohydrate. The following fruits in the measurement suggested will furnish 10 grams of carbohydrate. They may be included in the diet in partial replacement of the cereals. The fruits are:

(1) 1/2 medium sized *batabi* (shaddock) (3 chh.).
(2) 1 large orange (2 chh.).
(3) 12 grapes.
(4) 2 dates.
(5) 1/2 banana.
(6) 1/2 guava.
(7) 4 jack fruit (1 chh.).
(8) 1/2 ripe mango, small (1 1/2 chh.).
(9) 1/3 medium-sized papaya (2 chh.).
(10) 1/4 pineapple (2 chh.).
(11) 1 small apple (1½ chh.).

In suggesting the different menus the taste of the individual should be taken care of and the diet should be prepared in such a way that it becomes agreeable to the patient. It is not necessary to ask the patients to eat only boiled vegetables. Any preparations such as curries, soups, fries etc., of the vegetables may be used. Leafy vegetables should be fried with oil before it is eaten. The oil helps in the absorption of carotene present in the leafy vegetables and therefore frying should be preferred to boiling. What may be eaten as chapatis, parata, luchis. Condiments may be used according to the taste of the patient and care should be taken to see that the diet does not become monotonous.

It will be seen from the diet suggested that if the patient is agreeable to consume only 2 chhataks of rice it is not necessary to curtail the use of rice and replace it by whole wheat flour because the carbohydrate furnished by both of them are the same, weight per weight.

Patients suffering from mild diabetes are usually controlled if the above diet is prescribed. It has been found by experiments in animals that optimum vitamin C nutrition is necessary to keep the insulin-secreting cells of the pancreas in an active condition. Deficiency of vitamin C in the diet produces degranulations of the insulin-secreting cells of the pancreas which indicate a hypoactivity of the cells. The insulin content of the pancreas of vitamin C-deficient animal also becomes very low. Therefore, vitamin C in a dose, 10 mgm. per seer body weight might possibly help in the revitalization of the cells of the pancreas of the diabetic patients if prescribed along with the above diet. Diabetic patients who could not be made to pass sugar-free urine and whose blood sugar level could not be brought to the normal fasting level by the use of the above mentioned diet improved after the administration of vitamin C. Patients excreted sugar-free urine and the fasting blood sugar value reached normal level.

Treatment with Insulin

If the above treatment for a period varying between one and two weeks fails to control glycosuria the patient should be treated with insulin while the above

mentioned diet is consumed. A diabetic patient should be treated at once with insulin if

(*i*) acidosis is present,
(*ii*) diabetic symptoms cause disability,
(*iii*) the person suffers from acute infections, and
(*iv*) immediate control of glycosuria is urgent to prepare for an operation.

A mild diabetic patient would respond to 10 to 20 units of insulin in the form of protamine zinc insulin. A moderately severe case responds to 20 to 30 units of insulin. If it is possible to determine 24 hours' urinary excretion of sugar then the actual dose of insulin may be suggested as one unit of insulin for 2 gm. of sugar excreted. Thus, if a person excretes 50 gm. of sugar he should be given 25 units of insulin. Insulin unit has been so adjusted that 1 unit of insulin can metabolise 2 gm. of sugar. The dose of insulin should not be changed unless it is used for at least one week. If with protamine zinc insulin it is not possible to make the patient pass sugar-free urine during the different parts of the day it is better to use insulin mixtures. A 2:1 mixture of regular insulin and protamine zinc insulin prepared freshly in the dose calculated according to the amount of sugar excreted, if injected just before breakfast, maintains the blood sugar level more or less constant. Administration of globin insulin which is a slow acting insulin produces marked hypoglycæmia in the afternoon if injected before breakfast and as such is incapable of controlling a fairly constant blood sugar level. NPH insulin may, however, be used in place of 2:1 insulin mixture to maintain the blood sugar level more or less constant.

Treatment of Diabetic Coma

Signs of diabetic coma are general malaise, weakness, pains in the abdomen, drowsiness, nausea, vomiting, prostration, unconsciousness, acetone breath, dryness of mouth, laboured breathing, etc. When a diabetic patient suffering from ketosis comes for treatment his blood should be taken for examination of blood sugar, plasma carbon dioxide, urea nitrogen and non-protein nitrogen. The physician should not wait for the blood report and he should give the following treatment. 40 units of unmodified insulin should be injected and 100 units if the case is severe. If there is circulatory failure as evidenced by low blood pressure, 100 units of insulin should be injected intravenously and the patient should be kept in a warm bed. Intravenous infusion of normal salt solution at the rate of 10 c.c. to 20 c.c. per minute should be started. If an infection is present, injection of penicillin should be started forthwith. If the patient is vomiting his stomach should be washed, the bladder should be emptied by catheter. If the blood contains more than 20 vol. per cent of carbon dioxide the patient should be considered as suffering from mild ketosis and 20 to 12 units of insulin every 2 to 4 hours should be repeated until the blood sugar is below 200 mgm. per 100 c.c. and the urine contains a trace of sugar.

If the carbon dioxide content of plasma is below 20 per cent and the blood sugar is over 600 mgm. per 100 c.c. blood, at least 300 units of insulin should be injected in the first hour. If the blood sugar is over 1,000 mgm. per cent 400 units of insulin should be given. Insulin should be injected in different parts of the body for efficient absorption.

Every 2 to 3 hours the carbon dioxide content of the plasma should be estimated until substantial improvement has occurred. If the blood sugar does not fall the dose of insulin should be increased. The intravenous infusion should be continued until 2 to 3 liters have been administered. When the blood sugar begins to fall a 5 per cent solution of glucose may be transfused in partial replacement of the saline. After the fourth hour of treatment 1 gm. of potassium chloride is added to one liter of saline and transfused. Some physicians favour the intravenous injection of 250 to 500 c.c. of a 5 per cent solution of sodium lactate or sodium bicarbonate if there is no preliminary improvement after 3 hours of treatment or if the carbon dioxide remains below 10 vol. per cent.

As soon as possible food should be given per mouth. This should consist of fruit juice, barley water, glucose water.

If it is not possible to have examinations of blood keep a catheter in the bladder and if the urine contains 4 plus sugar 100 units of insulin should be given every hour. If after fourth hour urine still contains 4 plus sugar the dose of insulin should be increased to 200 to 300 units and this should be repeated till the glycosuria begins to decrease. When the urine test shows decrease in glycosuria to two plus glucose should be added in the intravenous infusion.

After 6 hours if the clinical condition and the laboratory test show satisfactory improvement insulin should be injected according to the urine test. Fluid administration should be continued till the dehydration is relieved. The patient should be given a total of 100 to 200 gm. of carbohydrate in the first 24 hours. After the first day the patient should continue to have complete rest in bed. Treatment with 2:1 mixture of insulin and usual diet should be started from the third day.

Controlled *versus* Free Diet in the Management of Diabetes

Some physicians advocate less rigid control of diet. The patient makes a free selection of diet and disregards glycosuria and hyperglycæmia as long as acidosis is absent. They argue that they are treating the patient and not the glycosuria. It has, however, been found that patients who followed a free diet regimen developed calcification of arteries at the periphery and retinopathy after several years (10-15 years) of treatment. Diabetics who take a controlled diet do not develop such complications so frequently.

CASE NOTES

ACQUIRED UNILATERAL GIGANTISM OF LEFT LOWER LIMB

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Unilateral gigantism of the lower limb in the tropics is commonly due to solid œdema from filarial infection. But we came across a case where gigantism was not due to filarial infection. We could not trace a similar case in the literature. We, therefore, thought it fit to report the case.

The conditions which lead to gigantism of a particular limb can be classified as:—

1. Congenital—
   (*a*) Congenital lymphatic fibrous hypertrophy (Milroy's disease).
   (*b*) Congenital arteriovenous fistula giving rise to a longer, thicker and warmer limb. Multiple cutaneous nævus (capillary hæmangioma) in these limbs and bruit on auscultation are diagnostic features.
   (*c*) Congenital neurofibromatosis in which there is diffuse nodular swelling with pigmentation of the skin.

2. Acquired—
   (*a*) Traumatic arteriovenous fistula.
   (*b*) Inflammatory:
      (*i*) This is due to recurrent attacks of erysipelas of the skin. In each subsequent attack the œdema is slower in disappearing (elephantiasis erysipelatis streptococcus nostras).
      (ii) Thombophlebitic lympœdema—
      Causes of thrombophlebitis—obstetric and post-operative thrombosis of deep veins lead to lymphœdema though there is a tendency for it to disappear after 6-8 months with treatment.
   (*c*) Post-traumatic lymphœdema—usual after a fracture of bones or injury of the soft tissue. This condition arises and it may be mistaken with Sudek's post-traumatic osteoporosis but it differs from that condition in being proximal to the site of injury. Telford and Simmons (1938) have shown that sympathectomy has got no effect. It cures spontaneously.
   (*d*) Neoplastic:
      (*i*) Usually it follows cancer of the breast and is formed in the upper extremity, Ewing's tumour of the lower extremity bones. It is due to blockage of lymphatics.
      (*ii*) Neurofibromatosis—elephantiasis neurofibromatosa and neurofibrosarcoma lead to gigantism of the limbs.
      (*iii*) Diffuse lipomatosis.
   (*e*) Parasitic lymphœdema due to microfilarial infection.
   (*f*) Spontaneous lymphœdema præcox of Allen, Baker and Hines. It is a unilateral condition of the lower limbs common in females between 10-25 years of age. The œdema at first pits on pressure later it becomes solid in character.

Case Report

History—A Hindu, male, aged 22 years, cultivator by occupation was admitted in the hospital on 15.3.51 with the following complaints:

1. Unilateral painful enlargement of the left lower limb from the iliac crest to the foot—duration 6 years.
2. A callous ulcer over the posterior aspect of the left sole—duration 8 months.
3. Gynæcomastia of the right side—6 months and on left 10 days' duration.

There was a history of trauma over the left calf muscles 6 years back followed by painful tender hot swelling at the site of trauma, after a month he noticed gradual enlargement of the left lower limb though the acuteness of the pain subsided gradually. Eight months back he developed ulcers on the sole (left) and left little toe which fell off after some time.

On examination—The left lower limb was markedly enlarged in girth only (Figs. 1 and 2, *vide* Plate). There was pigmentation of the overlying skin specially marked over the calf. Prominent veins were noticed over the medial aspect of the calf and gluteal regions. On palpation diffuse firm nodular swellings, mobile in transverse axis, non-adherent to the skin, tender on deep pressure were found throughout the posteromedial aspect of the limb from iliac crest to foot. The joint movements were free, temperature of the limb was normal and there was no pulsation. The inguinal lymph glands were markedly enlarged, painless, discrete, firm and non-adherent to the skin and deeper structures. Pressure on medial and external popliteal nerves by the tumour mass resulted in sensory loss of the heel, foot drop, trophic sore (painless) on the posterior part of the sole of the foot. The lower third of the fibula was much thickened and enlarged. Skin was not thickened.

MEASUREMENT OF THE GIRTH OF THE LIMBS:

	Left (affected)	Right (sound)
Mid-thigh	19 inches	14 inches
Popliteal region	16½ inches	12 inches
Mid-leg	17 inches	10½ inches
Foot	9 inches	8½ inches

Length of the lower limbs—equal.

Fig. 1—Pre-operative picture of the patient viewed from front. Note gynaecomastia of the right side which was subsequently removed.

Fig. 2—Pre-operative picture of the patient viewed from back

Fig. 3—Post-operative front view of the patient. Note gynaecomastia of the left side which developed later on.

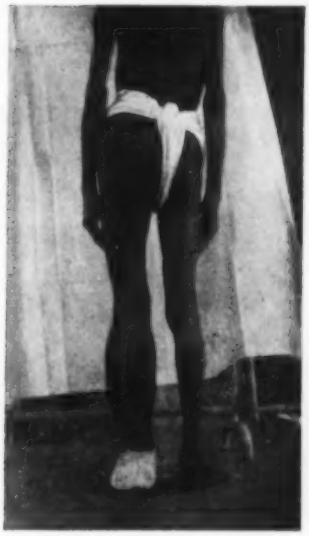

Fig. 4—Post-operative back view of the patient.

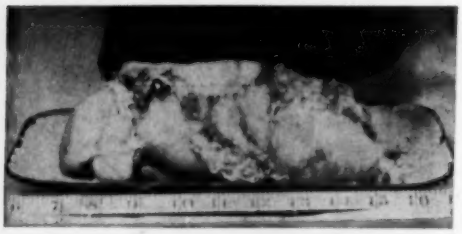

Fig. 5—One of the tumours 11 inches in length immediately after removal shows a post-preservative length of about 8 inches.

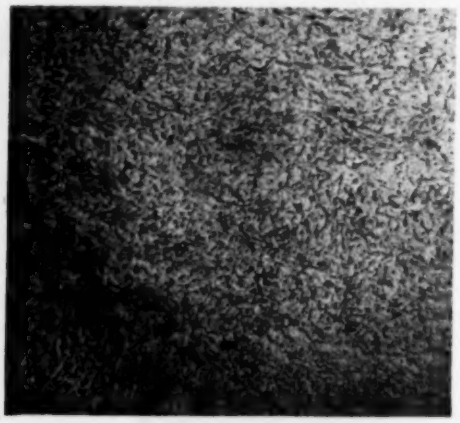

Fig. 7—Microphotograph showing fibromyxomatous structures of the tumour removed. (H & E × 400)

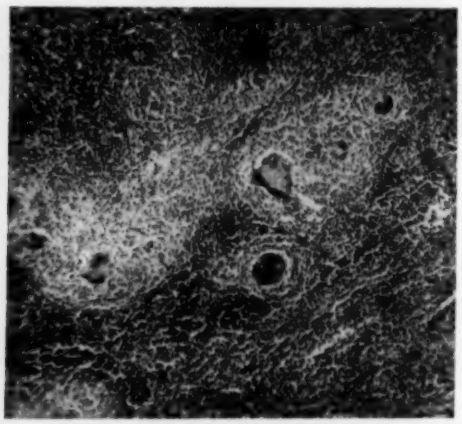

Fig 8—Microphotograph of the section of lymph node removed from the left inguinal region showing lymphocytic infiltration and tuberculous giant cell system. (H & E × 400)

Fig. 6—The same tumour as shown in Fig. 5. Originally measuring 6 inches in breadth it has shrunk to 4 inches on preservation.

Fig. 9—Microphotograph of the tissue removed from the trophic ulcer on the sole showing evidence of chronic inflammation. (H & E × 400)

Auscultation of the left lower limb: nothing particular.

External genitals: normal, pubic hair of normal disposition.

BLOOD EXAMINATION: W. R.—positive. Hb.—10·5 gm. per cent; W. B. C.—14,000/c.mm.; Poly—88 per cent; Lympho—12 per cent; R. B. C.—4 million/c.mm.; Blood urea and N. P. N.—51 mgm. per 100 c.c.; E. S. R. (Westergren): 1st hr.—75 mm.; 2nd hr.—25 mm.

HISTOPATHOLOGICAL REPORTS:

(*a*) Nodules from popliteal and gluteal regions as well as from other sites show fibromyxomatous structures (Fig. 7, *vide* Plate).

(*b*) Lymph nodes show evidence of tuberculous lymphadenitis with giant cell system and lymphocytic infiltration (Fig. 8, *vide* Plate).

(*c*) Tissue from ulcer shows evidence of chronic infection. (Fig. 9, *vide* Plate).

(*d*) Breast shows normal structures.

SKIAGRAPHY: Left fibula shows evidence of generalised osteoperiostitis. Other long bones and hip bone of the left side show no evidence of abnormality. Sella turcica is normal.

Operation—It was performed by one of us in three different stages:—

(*i*) Popliteal region.

(*ii*) Upper thigh and gluteal regions.

(*iii*) Calf region.

During the operation the tumour was found to be well encapsulated; nerves and blood vessels were freely separable in the popliteal, upper thigh and gluteal regions, but the tumour mass was found protruding in between the muscle fibres in the calf region. Three well encapsulated big cylindrical tumours were removed easily from popliteal, upper thigh and gluteal regions (Figs. 5 and 6, *vide* Plate). The tumour of the calf region could not be removed due to its firm attachment with the calf muscles. The wound healed by first intention.

Progress: There was relief of heaviness of the left lower limb, as felt by the patient, to a certain extent after removal of three tumours (Figs. 3 and 4, *vide* Plate). The swelling in the calf region was increasing in size clinically. There was no improvement in nerve conditions, viz., foot drop, sensory loss at heel and tropic sore on the sole.

Discussion

The case under review is interesting for several reasons: It is not the usual type of unilateral filarial lower limb lympœdema so commonly met with in tropical countries. Secondly, the clinical findings and laboratory examinations are so diverse that they cannot be grouped together for any single clinical condition. Thirdly, it is very unusual for myxofibroma to produce such a huge lower limb. Fourthly, for the type of treatment to be adopted in the case. And, fifthly, for the absence of improvement of nerve palsy even after removal of tumour masses.

The absence of thickening of the skin, no history of periodical attacks of fever and multiple diffuse swellings were all against the often-met filarial elephantiasis of the lower limb. The diffuse firm nodular scattered swellings led us to think of it as a probable case of one of the varieties of neurofibromatosis. The question of malignancy was ruled out by the duration of the disease, absence of pain, and healing of wounds by first intention after each biopsy. The absence of pigmentation over the whole lower limb which is very characteristic and histopathological reports did not confirm the clinical diagnosis of neurofibromatosis. Though soft or hard fibroma may arise at any rate in connection with fibrous tissue yet such a distribution is not commonly met with. Soft translucent jelly-like myxomatous tumours usually in relation to tendons, periosteum, joints and occasionally in the heart are of rare origin but they are of frequent occurrence in other tumours, *e.g.*, polypi, chondroma, sarcoma, etc. The histological report of lymph nodes perplexed us further. The congenital and vascular conditions can be safely eliminated by the absence of the vascular phenomenon. Blood hormonic estimation could not be undertaken due to lack of facilities.

Summary

1. A unique case of acquired unilateral left lower limb gigantism is reported.

2. Diverse clinical and laboratory findings such as firm nodular swellings of the limb, gynæcomastia both sides, tuberculous inguinal lymphadenitis and positive blood W. R. perplexed us in fitting in the case as a single clinical entity.

3. Possible congenital and acquired causes leading to gigantism of a limb are discussed.

4. Review of medical literature could not help us in tracing such a case.

Acknowledgment

We wish to thank Dr. A. K. Dutta Gupta, Principal-cum-Superintendent, Nilratan Sarkar Medical College and Hospital, Calcutta, for permission and encouragement to report the case, Dr. A. K. Saha, D.SC., M.B., F.R.C.S. (ENG. & EDIN.); MCH. ORTH. (L'POOL), Associate Professor of Surgery and Surgeon, Nilratan Sarkar Medical College and Hospital, Calcutta, for his kind help in preparing the paper; Dr. Anil Chaudhuri, M.SC., M.B., D.T.M., of R. G. Kar Medical College and Metropolitan Nursing Home and Laboratory, Ltd., Calcutta, for histopathological investigation; and, the other staff of the ward for co-operation in various ways.

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NEUROPARALYTIC KERATITIS

R. C. AGARWAL, M.B., B.S., D.O. (OXON),
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Sheodan Singh, 21 years of age, presented himself complaining that he was unable to close his eye on the left. There was watering and soreness. He also complained that he could not chew his food properly and comfortably and that liquid matter escaped from the mouth on the left side during mastication.

Past history revealed that about a year back he was injured on the left side of the face while plying the persian wheel for watering fields in his farm. He was looking for something gone wrong with the working of the wheel when the catch of the wheel gave way and all so suddenly the stem rod hit him hard on the left side of the face fracturing the zygomatic process of the maxillary bone. He fell unconscious instantly. He was treated at the district hospital.

Examination showed marked asymmetry of the face, left side showed depression of the zygomatic process, dropping of the angle of the mouth downwards and laterally. There was incomplete closure of the palpebral fissure revealing the whole of the bulbar conjunctiva below the cornea. Speech was affected in clarity.

There was marked loss of sensation round about the lids, over the maxillary prominence and on the medial aspect of the nose. Bulbar conjunctiva and cornea were completely insensitive to cotton-wool touch. There was an ulcer on the cornea at six o'clock, staining to fluorescein.

Routine and conservative treatment of the ulcer was carried out without any appreciable relief. The ulcer stained long after the conjunctival and ciliary injection disappeared. The eye was kept bandaged. The patient started complaining after about a week since he was not getting any appreciable relief and benefit. He had been treated similarly on previous occasions.

It was now decided to change the line of treatment. Median tarsorrhaphy was performed and he was advised to keep it up for six months in the first instance along with vitamin A drops, Dionine 2 per cent once daily and vitamin B complex one tablet three times daily. It was suggested that he should report every month.

The report after the first month was quite encouraging. He was getting strength in mastication. The lids were contracting better. There was no trouble in the eye behind the closed lids. Round about the third month he started feeling the sensation of cotton-wool touch on the affected part, mastication was much better. He started feeling the smarting sensation of the mildly irritating drops of sodium sulfacetamide 10 per cent.

It was intended to keep up the eye closed for another period of three months but the patient was getting restive and insisted on its opening. On opening the lids, the conjunctiva and cornea were found quite bright There was no congestion of the eye. An opacity of small size was present at the site of ulcer. Lids immediately closed on corneal touch. Lids closed without an additional effort but lagged behind on tight closure. Mastication gave no trouble. He was advised to carry on with the same treatment for another month and stop all treatment after that. Periodic check up was advised as a parting advice.

Discussion

It is not commonly seen that a combination of such symptoms occur *viz.*, paralysis of the facial and the trigeminal nerves causing weakness of mastication and incomplete closure of lids, loss of sensation over conjunctiva and cornea and skin round about the lids etc.

Neuroparalytic keratitis due to lagophthalmos is understandable. It can be explained in cases of lesions of Gasserian ganglion either by trauma, tumour or inflammation. But the combination of the symptoms shown by the patient is rare indeed. It is well-known that all branches of the facial communicate with sensory branches of the trigeminal nerve and an extensive sensory-motor plexus is formed below the infra-orbital foramen being the most important anastomosis between the two. Injury to facial nerve will cause loss of motor function of muscles of the lids and voluntary closure of the lids. Movements of blinking originate centrally and are caused by a periodic discharge of impulses through the facial nerve. This nerve forms a component part of a reflex arc " trigeminofacial " responsible for spontaneous winking. Any injury to the facial nerve abolishes automatically the function of this reflex arc. But loss of tactile sensation over the affected parts and weakness of mastication are indicative of loss of function of the trigeminal as well which are independent of the facial paralysis or the reflex arc formed by the two. The trigeminal also sends a motor nerve to muscles of mastication.

This case had evidently paralysis of both the nerves due to the trauma on the left side of the face. The facial nerve lies exposed to any trauma when it emerges on the face round about the ramus of the mandible. Gasserian ganglion also lies in quite close proximity—only 2½ inches medial to but a little higher than the articular tubercle at the root of the zygoma, in the space known as cavum Meckelii. The motor root of the trigeminal enters the cave of Meckel beneath the main nerve to become a component part of the mandibular nerve. An injury sufficiently severe to cause fracture of the zygoma is likely to involve the ganglion as well. Facial nerve was involved by the direct hit but Gasserian ganglion seemed to be affected by the hæmatoma formation at that site involving all the three branches of the trigeminal nerve, and hence weakness of mastication and loss of sensation over the affected parts.

Tarsorrhaphy was performed to prevent the eye from effects of trauma, desiccation and infection. Counter-irritants were given as eye drops to keep up slight hyperæmia of the conjunctiva and to prevent the cornea from degeneration. Vitamin A drops were given as lubricant to the conjunctival surface and as nutrient as well. Vitamin B complex was given to help in regeneration of the traumatised nerves.

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SUDDEN DEATH IN CHILDBIRTH

Childbirth is an event which involves a normal, natural and physiological function. But every doctor knows, only too well, how a process of labour, proceeding apparently normally can easily and without any warning, overstep the limits of normalcy, become pathological, threaten the life of the parturient and, in some cases, kill her in spite of all efforts of the attendant, sometimes with dramatic suddenness. While such cases now and then fall to the lot of every experienced obstetrician, it is somewhat curious that many textbooks do not appear to stress upon this aspect of the problem sufficiently enough. With increase and spread of medical knowledge, newer and better methods of fighting diseases and disabilities are being discovered every day while, on the other hand, newer and stranger threats to life seem to be met with in every field of life—including the reproductive function.

Sudden death in childbirth always has a peculiar strangeness about it. The reproductive function is generally and naturally regarded as a normal physiological process with a happy ending for all concerned, the parturient herself, her relations and also the obstetric team. A sudden death occurring in such a setting is really a "bolt from the blue" and extremely difficult to reconcile. A clear understanding, of all the factors concerned in such events, is therefore of great help in the management, and highly desirable at all times.

Sudden death during childbirth may be caused by various factors. One big group consists of extragenital causes wherein the performance of the reproductive function is only the exciting factor; e.g., cardiac diseases, like mitral stenosis, straining at labour, rupture of blood vessels in the brain, lungs, in gastric ulcer, etc. But the majority of the cases are where the fact of childbirth is directly responsible. The commoner amongst these are shock following a difficult, prolonged, although spontaneous, unaided, labour, and those after difficult obstetric operations. These include factors like rupture of the uterus, acute inversion of the uterus, postpartum hæmorrhage, acute toxæmias and meddlesome operative interferences in constriction ring dystocias. Occasionally the nervous shock of labour may cause syncope and even death in a highly strung nervous individual. The cases of so-called "obstetric shock" are usually found to belong to some of these groups on careful scrutiny and analysis. Conditions affecting the lungs, like acute pulmonary œdema or pulmonary embolism also occasionally cause sudden death in childbirth. Embolism from blood clots in presence of sepsis affecting the pelvic veins, in pelvic-vein-thrombosis caused by prolonged operations with exaggerated lithotomy positions, as well as occasional air embolism, specially in cases of placenta prævia, have been known as occasional killers during childbirth.

Another threat to the lives of women in labour appears to have been found out. Steiner and Lushbaugh[1] in 1941 reported about eight cases of death caused by death from anaphylactic shock due to pulmonary embolism caused by amniotic fluid. Clinically the diagnosis is made by profound shock occurring suddenly and most unexpectedly in a woman having a rather difficult and prolonged labour or who has just finished a labour with a large perhaps a dead fœtus and with meconium in the amniotic fluid. The clinical diagnosis is established better in cases with a more complete picture of sudden chill, dyspnœa, cyanosis, vomiting, restlessness, a pronounced fall of blood pressure and a thin running pulse. Since the first reports in 1941, it appears that about 30 such cases have so far been reported[2], [3], [4]. It is quite possible that a still larger number of cases of this type actually occurred but these might have gone unreported. It is difficult to assess the incidence of this cause of death in childbirth, despite the fact that Steiner and Lushbaugh estimated it to be 1 in 8,000 confinements; while Gross and Benz[5] reported 3 cases in 1 year in a hospital with 1,200 to 1,300 annual confinements. Most of the patients have been in the older age-groups and very often with one or two children, though multiparous women have also died with this condition. The pregnancy has often continued beyond term and the fœtus has usually been large with the labour being characterised by strong uterine contractions although the total duration might be quite normal. The characteristic findings at autopsy are the presence of amniotic fluid contents and meconium in the smaller pulmonary vessels. These elements may also be found in the vessels of other internal organs. In cases where permission for a regular autopsy is not obtained, blood obtained from the right side of the heart, on centrifugation, may show a fluffy layer above the usual leucocytic cream[6], and epithelial squamæ may be demonstrated from smears or paraffin sections of the material.

Leary and Hertig[6] studied the possible placental factors in amniotic fluid embolism with a study of 14 placentæ in which amniotic squamous cells were found indicating the presence of amniotic fluid within the placenta or its membranes. They found squamous

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[1] *J. A. M. A.*, **117**: 1245 & 1340, 1941.

[2] *Am. J. Obst. Gynec.*, **64**: 72, 1952.

[3] *Ibid*—**64**: 118, 1952.

[4] *Ibid*—**64**: 201, 1952.

[5] *Surg. Gynec. & Obst.*, **83**: 315, 1947.

[6] *New England J. Med.*, **243**: 588, 1950.

cells between the amnion and the chorion in 9, in the marginal blood clots in 2, in the decidua at the placental margin in 1, in the decidual sinusoids on the maternal surface in 1; and in another case, squamous cells were found in all the three sites.

Landing[7] undertook a study of the uterine factors in the pathogenesis of amniotic fluid embolism. His results showed that the amniotic fluid enters the maternal circulation only by way of uterine or placental vessels which have been opened up abnormally, e.g., in placenta accreta, cæsarean section, rupture of the uterus, partial separation of the placenta and premature marginal separation of the placenta. Abnormal hæmorrhagic manifestations have often been observed in these fatal cases of amniotic fluid embolism[3, 4, 8, 9]. Weiner and his associates[8, 9], have shown that the amniotic fluid exerts a coagulant effect similar to that of thromboplastin and also that this effect may be countered, at least *in vitro*, by heparin. Sublethal injections of thromboplastin into animals have been shown to produce shock and increase the clotting time as a result of defibrination [10, 11, 12]. In the case reported by Eames[4] there was no clotting of the blood, in three tubes, even after two and a half hours. It has been suggested that amniotic fluid might also act similarly by decreasing fibrinogen after producing intravascular clotting, which in its turn might lead to postpartum hæmorrhage and delayed clotting of blood.

Steiner and Lushbaugh were able to reproduce a clinical picture in experimental rabbits and dogs, similar to that seen in these patients, by intravenous injections of meconium and unfiltered amniotic fluid; but were unable to get the same by injecting filtered amniotic fluid.

Steiner and Lushbaugh concluded that the pulmonary embolism by amniotic fluid and meconium brought about an anaphylactic shock, and that the circulatory collapse, uterine hæmorrhage and other phenomena were due to secondary anaphylactic reaction. Several other workers[13, 14, 15], have experimentally corroborated these findings, emphasising the difference between these reactions and those due to true anaphylactic reactions by the presence of thrombosis in veins and emboli in the lungs.

While Steiner and Lushbaugh[1] in their original report considered the amniotic embolism as an unpredictable and unpreventable obstetrical death, recent observers tend to impress that at least some of the deaths included in this group could be classified as preventable. The use of posterior pituitary extract should be restricted, or at least carried out only under expert supervision. Tetanic contractions of the uterus should be controlled properly, if necessary, by general anæsthesia. Weiner and Reid[8] suggest that amniotic fluid normally plays a role in the coagulation of intrauterine bleeding and that this assists in postpartum hæmostasis. They also suggest the intravenous administration of 50 to 75 mgm. of heparin with the idea that this might be effective in decreasing the clotting activity of the amniotic fluid that has escaped into the maternal vascular system.

In a recent article, however, Tunis[3] critically analyses 25 of the reported cases of amniotic fluid embolism and refuses to recognise the microscopic findings and their conclusions in most of these cases. He is of opinion that out of these 25 cases, 7 had serious internal diseases, 5 had intrapartum or postpartum hæmorrhages, 8 had rupture of the uterus and 5 had findings insufficient enough to confirm the cause of the fatality. In other words, he is of opinion that, out of the 25 cases analysed, 20 had a definite cause of sudden death other than the attributed amniotic embolism.

Tunis[3] contends that the capillaries of the lungs, as also those of other places, in a pregnant woman, suffer from some paresis with consequent disturbance in the exchange of fluids due to increased capillary permeability. Besides during pregnancy, there is considerable capillary stasis. Tunis opines that the postmortem lung-findings are largely due to these conditions, to be found even in normal pregnancies. Moreover, he has seriously contended the toxicity of the amniotic fluid and its contents, *e.g.*, meconium as also the conclusions and inferences of the experiments undertaken by various authors.

In view of the conflicting opinions thus prevailing, it is perhaps not possible to arrive at final conclusions as to the cause, pathogenesis, and the effect produced by them: in bringing about many cases of sudden death in childbirth which occur even in experienced hands and often with unexpected dramatic suddenness.

It is to be hoped that further observations and wider scope for postmortem examinations will eventually lead to the ultimate solution of these problem-cases.

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ANOTHER EX-PRESIDENT PASSES AWAY

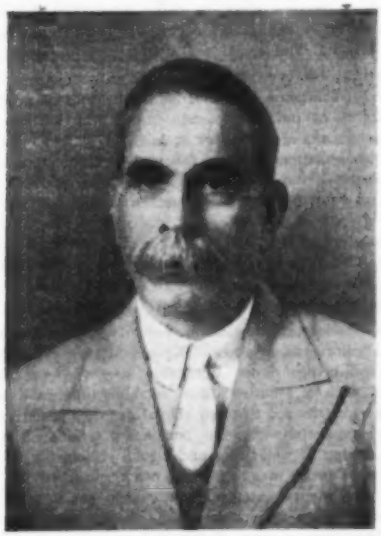
In our June issue we announced the death of Dr. U. Rama Rau, President of the Indian Medical Association 1935-36, and reminiscenses of his sad demise still fresh in our mind, we receive the news of the death of Dr. Bhupal Singh of Meerut,—another stalwart of the Indian Medical Association. Dr. Bhupal Singh was one of the past presidents of our Association. He presided over the 16th Session of the All-India Medical Conference at Lahore in December 1939.

DR. U. RAMA RAU

Dr. Bhupal Singh was born on the 29th February, 1878. He belonged to a zemindar family of Bijnor district, U.P. After passing his M.B. examination, he was appointed a Lecturer at Government Agricultural College, Kanpur, and then at Agra Medical College. He resigned from service in 1912 and started independent practice in Meerut. Very soon he became the leading practitioner as physician and surgeon in the western districts of U.P. During the First World War, Dr. Bhupal Singh offered his services as Hony. Medical Officer at the Military Hospital, Meerut. In 1920 he joined the Indian National Congress. He was a habitual wearer of khaddar and a staunch nationalist. He became the president of the All-India Jat Mahasabha in 1929 and was Secretary to the Meerut College for several years.

Dr. Bhupal Singh founded the Meerut Medical Association, now Meerut branch of the I.M.A. and the Garvie Medical Library. He organised the U.P. Provincial Branch of the I.M.A. for which he toured the districts on his own and at his cost. He rendered invaluable service to the I.M.A. His contributions in such important matters as revision of Association rules will long be remembered.

He was a member of the Medical Council of India. When the Agra Medical School was converted into a College, Dr. Bhupal Singh was elected convener of the Board of Studies, and was a member of the first Medical Faculty of Agra University. Dr. Bhupal Singh was a man of uncommon determination. The Poison Act of U. P. which had to be rescinded by the Government was due to his untiring effects. He was unostentatious, highly moral and ethical and his charities knew no bounds. He donated freely to educational institutions and gave scholarships to poor students. In professional life he not only visited on indigent patients free but would also pay for their medicine and diet. He was a friend, philosopher and guide to junior medical practitioners.



DR. BHUPAL SINGH

We offer our sincerest condolence to the bereaved family.

May his soul rest in peace!

CURRENT TOPICS

STATEMENT ON MEDICAL ASPECTS OF SOCIAL SECURITY BY WMA

The World Medical Association which comprises in its membership the national medical associations of 13 countries with a total membership of nearly 7,00,000 doctors, presented the following document to the International Conference on Minimum Standards of Social Security held in June, 1952. This document represents the opinion of the practising doctors of the world on the question of medical care under Social Security Organisations. In view of this, the statement contained in the document reproduced below, deserves the attention of Governments and representatives of Management and Labour of all countries throughout the world.

Social Security is a concept of great interest to doctors. Its aims-to make possible the development of healthy and happy human beings—in theory, run parallel, even coincide, with those of the medical profession. This necessitates close relations between promoters of social security and medical men. The development of the notion of health during the 1st half of this century further stresses the need for co-operation between these two groups. Modern medicine more and more stresses that somatic health cannot be achieved without mental health. Health is a synthesis of mental and physical elements, tending toward a state of balance. The views of doctors have become close to those who have inspired the internationally adopted definition of health as complete mental, physical and social well-being.

There is, however, a strong theoretical element in this definition. Well-being is not equal to the sum of satisfactory mental, physical and social conditions as laid down in official and other documents. Rather it is based on an emotionally founded appreciation of these favourable circumstances. The social component, regardless of any absolute qualities it may possess, may not be felt as satisfactory and so will not contribute to a state of well-being. Decisive here are highly complex mental reactions, determined on the one hand by such factors as environment, character, education and heredity, and on the other by the means through which the social security has been achieved.

This is important. Social security as a product of individual effort and a reward for personal ability will promote mental well-being. More debatable are the psychological effects of such a security based on communal activity and on benefits distributed through official agencies sometimes only remotely connected with the beneficiary. Satisfaction leading to a feeling of well-being under such circumstances is very uncertain. Benefits are only too often mistaken for rights. In countries where systems for advanced social security are in operation, the outcome does not, in fact, seem to promote general happiness, a sense of personal obligation, mental well-being, or therefore, good health.

The average man cannot appraise the relationship between services rendered and equivalent returns, or judge whether he is getting a fair deal. He will tend to disregard the cost, and always suspect that he does not get a return for his money if, through taxation, he pays a lump sum for a number of benefits, each one of which seems to him to be small. If these taxes are high he will be further encouraged to demand more in return, and this, often for political reasons, generally leads to increased returns and to new benefits—at increased cost, increased taxes, and increased or renewed displeasure, all of which endanger mental well-being.

Another point might be made here. Most people are still brought up on old established principles of ethics and behaviour. One of these is that a man should primarily be responsible for himself and his activities. He finds, however, that his activities are hedged round with restrictions and that many of his former responsibilities are being taken away from him. With them go much of his old freedom and even more of his earnings—and he finds himself burdened with new tasks, this time not for himself but for some remote conception such as the state or the community. Consciously or unconsciously he reacts with displeasure—and again his mental well-being suffers.

The psychological repercussions of modern social security schemes are not altogether satisfactory. They should be studied before new plans are made and further steps taken—or they will get worse. Naturally conditions vary, and the descriptions given of the average man's dilemma are not universally applicable. But they are applicable to those " advanced " countries where efforts to solve the individual's problems by collective measures have had considerable practical consequences, and which are, therefore, held up as examples to others still having a long way to go before they can begin even to think in terms of an advanced social security, or indeed any security at all. Because of this it is imperative that the medical profession's experiences of the functioning of social security schemes should be made known to promoters and administrators of such schemes. They, too, should continuously consult the medical profession before new plans are made or old ones remade, because it is intended that doctors become more and more involved in the determination of liabilities under the systems adopted.

Fundamental for the success of any security system is its psychologically correct structure. It must not allow the individual to forget that his security is primarily a matter for his own efforts. It is unwise for him to be led to believe that the state or community can take over and relieve him of his responsibilities. Any system created without the observance of this will from the very beginning carry within itself its own seeds of destruction. On the one hand it will never really contribute to health equal to well-being—for reasons already given. It will defeat its own ends. On the other hand it will tend to a steady and uncontrollable expansion at equally uncontrollable costs. These serious consequences are already seen in many countries, and they will, with growing over-population and increasing average length of life, become impossible to master. The productive capacity of the country will be so heavily burdened for the benefit of an increasing number of consumers that governments will in the end not be able to stand the cost, unless other equally or even more important fields of activity are neglected. As " social security " in many parts of the world is the political slogan of the day this may well happen—and as a matter of fact does happen.

The extent to which the individual and his country contribute to his welfare and that of his fellow citizens is a problem for each country to solve, but it is always of great importance to the medical profession. Doctors are concerned because of their experience with various schemes that have been proposed and sometimes adopted. As ILO states, there is a growing tendency to set up public services affording complete medical care, preventive or curative, without distinction of the temporary or chronic nature of the contingency or of occupational or general origin of the disease or accident. There is also a tendency to loosen the ties between benefit right and contribution payment, and to create a public service

for the citizenry at large, making all care and supplies available at any time and without time limit, subject only to the doctor's judgment.

The WMA considers this to be incompatible with principles which it believes to be fundamental. If the ties between benefit right and contribution payment are loosened, the individual will ignore the cost of the services given. If insurance principles are abandoned for public service schemes, he will tend to lose his sense of responsibility. If social security costs burden the individual with heavy taxes, he will end by asking for compensation in the shape of more benefits, and he will tend to place his security more or less completely in the hands of society, forgetting that this society after all is nothing but himself and his neighbours.

All this complicates matters for the medical profession. It is willing and eager to shoulder its own responsibilities. The success of its work, however, is the result of team-work where the team consists of two members: the doctor and his patient. Much depends on the co-operation of the latter. Restoration to health to a great extent depends on the will of the patient to get well: this must be encouraged. If the will is there, doctors can the more easily heal their patients as well as control the functioning of social security in their own field—both fairly successfully. If it is not, they will probably fail.

The WMA would finally like to point out that everywhere in the field of social security stress should be laid on prevention and rehabilitation. The primary aim must be to create healthy conditions of living—for example, with regard to housing, nutrition, clothing, recreation and working conditions. The higher a country's development the less should be the need for official promotion of social security. It might well be asked whether an extensive and costly social security system really is a sign of soundness and advanced development of a country.

The WMA has in this paper so far dealt with some of the consequences of social security which have an indirect influence on the work of doctors. There are more direct ones, the intensity and scope of which are in proportion to the extent to which the medical profession is employed by or tied to the social security organization. As the doctor and his patient form a sort of unit, it is impossible here to make clear distinctions—what has an influence upon the one effects also the other. However as a social security scheme can do anything between two extremes—one leaving the medical profession entirely free, and the other transforming it into a group of whole-time employees—the General Assembly of the WMA, at its meeting in Geneva, 1948, set down the following twelve principles of social security, as expressing the views of the profession on the relationship between itself and social security:

Whenever medical care is provided as part of social security, the following principles should govern its provisions:

I. Freedom of choice of physician by the patient. Liberty of physician to choose patient except in cases of urgency or humanitarianism.

II. No intervention of third party between physician and patient.

III. Where medical service is to be submitted to control, this control should be exercised by physicians.

IV. Freedom of choice of hospital by patient.

V. Freedom of the physician to choose the location and type of his practice.

VI. No restriction of medication or mode of treatment by physician except in case of abuse.

VII. Appropriate representation of medical profession in every official body dealing with medical care.

VIII. It is not in the public interest that physicians should be full-time salaried servants of the Government or social security bodies.

IX. Remuneration of medical services ought not to depend directly on the financial condition of the insurance organization.

X. Any social security or insurance plan must be open to the participation of any licensed physician, and no physician should be compelled to participate if he does not wish to do so.

XI. Compulsory health insurance plans should cover only those persons who are unable to make their own arrangements for medical care.

XII. There shall be no exploration of the physician, the physician's services or the public by any person or organization.

Some of these principles are self-explanatory, others, perhaps less so. The World Medical Association would like to make the following comments thereon, in order to clarify their meaning:

I. *Freedom of choice of physician by the patient. Liberty of physician to choose patient except in cases of urgency or humanitarianism.*—Administrative and financial considerations must not be allowed to interfere with the freedom of the patient to choose (and change) his doctor and *vice-versa*. The intimate personal relationship between physician and patient makes any compulsion harmful, for where there is compulsion, trust and confidence are impaired to the detriment of the patient's welfare.

II. *No intervention of third party between physician and patient.*—When medical care is provided as part of social security, the state or the local authority or the insurance company enters into relationship with patient and doctor. Such relationship must not involve interference with essential freedoms of either, and no method of payment of doctor or condition of service should be introduced without prior consultation with, and the consent of the medical profession.

III. *Where medical service is to be submitted to control, this control should be exercised by physicians.*—The greater the knowledge of what is being controlled the more efficient —and in medicine the more human—will be the control. Non-medical control of medical service introduces elements of distrust and frustration. The medical profession has never been short of able and devoted doctors, experienced in the practice of medicine, who are prepared to undertake administrative responsibility, and they should hold key positions in the administrative direction of medical services. Medical administrators should be so chosen as to command the fullest confidence of all concerned.

IV. *Freedom of choice of hospital by the patient.*—This freedom must of course have some topographical and medical limitation. It is directed against compulsory usage by patient and doctor of a hospital simply because of its propinquity.

V. *Freedom of the physician to choose the location and type of his practice.*—Except in time of national emergencies,

the medical profession is resolutely opposed to the direction of practising physicians to certain places or to certain types of work. Such direction is an infringement of the liberty of the subject. Negative direction that is direction by exclusion, is something which may be against the real medical interests of the community in which it operates.

VI. *No restrictions of medication or mode of treatment by the physician except in case of abuse.*—The freedom of the doctor to prescribe according to his conscience whatever treatment he thinks necessary for his patient is fundamental to the art and science of medicine. Any compulsion on the doctor to prescribe specific forms of treatment would be to impose on him a therapeutic orthodoxy which would hinder the progress of medicine.

VII. *Appropriate representation of medical profession in every official body dealing with medical care.*—Just as doctors should be in positions of control at every level in the administrative work connected with medical care under social security schemes, so should they be fully represented on the various advisory bodies at every level. The association of the organized medical profession with controlling and advisory bodies will evoke the maximum sense of responsibility in the medical profession to the community it serves and so be in the highest interests of the patients.

VIII. *It is not in the public interest that physicians should be full-time salaried servants of the Government or social security bodies.*—This principle is directed against the practice of personal medicine by full-time salaried doctors against, that is, a full-time salaried state medical service. It is recognized that if the medical profession is to be in a position of control in providing medical care in social security schemes, some full-time salaried administrative posts must be occupied by doctors. It is recognized, too, that some full-time salaried doctors, for example, medical superintendents may have to be appointed in hospitals owned by the state or the municipality. But as human beings, including doctors, are so variously endowed and by nature unequal in their mental and physical capacities, any attempt to equalize them by establishing fixed salaries will lead to frustration of spirit, discontent, inefficiency, idleness and an unbalanced state of affairs. As a general rule, to pay by salary carries risk of imposing limitation of effort, and in the case of the physician who provides personal medical care this is against the interests of the patient, in fact, detrimental to him. It is a sound principle to leave to each practising doctor the task of imposing upon himself those limitations of effort which by experience he knows are necessary if he is to give of his best to the patients under his care. Any attempt to restrict hours of work or capacity for earning a reward for work incurs the grave risk of attempting to produce a standard doctor for a standard patient—to put human nature into a strait-jacket.

IX. *Remuneration of medical services ought not to depend directly on financial condition of the insurance organization.*—The remuneration of doctors providing medical care in a social security scheme must be related to their status and prestige in the community, to the duration, arduous nature and costs of their education, and to the hazards of an occupation which means constant strain and exposure to such risks as infection. The cultural and ethical standards of a civilized society depend for their maintenance and promotion principally upon the integrity and example of the learned professions, of which medicine is one—and one whose influence on society is now greater than at any other time in history. There is a grave danger that social security schemes, however idealistically conceived, will progressively diminish the cohesive moral and cultural force emanating from the corporate life of the learned professions. The fundamental fallacy of the planners of social security schemes is the ignoring of this force, coupled with a tendency to regard practising doctors merely as technicians employing certain technical skills.

X. *Any social security or insurance plan must be open to the participation of any licensed physician and no physician should be compelled to participate if he does not wish to do so*—Self explanatory.

XI. *Compulsory health insurance plans should cover only those persons who are unable to make their own arrangements for medical care.*—With the high cost of medical care at a time of rapid expansion of medical science, the medical profession recognizes that in a wide range of physical and mental disorders the individual's capacity to meet the full cost of treatment and restoration to health is often severely limited. But the greater the degree and range of compulsion the greater will be the loss of personal responsibility. To impose compulsory insurance upon those able to care for themselves is to attack the rights and ideals of minorities in society. The WMA believes that assistance through social security schemes should be given only to those who need it. Those who do not need it should make provision for themselves either through thrift or through voluntary insurance.

XII. *There shall be no exploitation of the physician, the physician's services or the public by any person or organization.*—Self-explanatory.

Conclusion

All schemes of Social Security more or less restrict the liberty of the individual. Such restrictions are and must be accepted by persons living in a community, as a form of self-government. Doctors are interested in and welcome plans for medical care which enable them to look after their patients more efficiently.

Doctors are, however, perturbed by possible unfavourable effects of Social Security schemes on individual men and women. While they recognize that society has an obligation to help those who through nature, nurture, accident, disease and environment are handicapped in the struggle to survive, they fear the demoralizinng effects of state paternalism exercised on adults.

A powerful factor in recovery from illness and in restoration to health is the sense of personal responsibility of the patient for what happens to him. This is something indispensable in the doctor-patient relationship. In what is called the Welfare State, Social Security Schemes loom large, and in these schemes the provision of (apparently) free medical services is important. The more the State does for the individual in this direction the less is the individual sense of obligation and responsibility.

Apart from these psychological considerations, financial implications of Social Security schemes cannot be without concern to doctors. For example, the demand of patients for drugs leads to a disproportionate expenditure on ineffective remedies. This diverts money from what may be more important medical services, because expenditure on medical services of all sorts cannot be unlimited—except in Utopia.

Modern medical thinking stresses the balance of mental and physical factors in the health and well-being of the individual. Any Social Security scheme which stresses one factor and neglects the other will disturb this balance to the disadvantage of the individual.

Therefore, it is recommended that:

1. *When Social Security schemes are necessary, they should be developed in the closest collaboration with the medical profession. Such schemes should take into account the psychological effects on the beneficiaries dependency and diminished responsibility.*

Therefore,

2. *The fundamental aim of a Social Security scheme should be to raise the individual to a level at which he can help himself. From this, it follows that:*

3. *Any Social Security scheme should contain elements that encourage self-reliance and a sense of personal responsibility, and that:*

4. *Any Social Security scheme should stress the obligation of the individual to make at least part of his contribution directly to the function and costs of the scheme.*

MEDICAL REGISTRATION WITH G.M.C.

The following communication dated 13-8-52 addressed to the Hony. General Secretary, I.M.A., by the Medical Director, Empire Medical Advisory Bureau, British Medical Association, London, W.C.1 is published for general information.

"I think that possibly some of your members who are coming to this country for further postgraduate experience may like to have up to date information about Medical Registration here in view of recent legislation and I enclose a copy of notes which may assist them.

"Present arrangements require the production of less documents by applicants for full registration than will be necessary after 1st January, 1953, and are less likely to give rise to delay in registration. The present arrangements continue in force till 31st December, 1952 and overseas doctors who may be eligible under present arrangements are advised to register with the General Medical Council before the end of the year if they are contemplating any form of medical practice whilst in this country."

Notes on Provisional and Full Medical Registration under the Medical Act, 1950

Definitions:

A "house officer", *for the purposes of registration*, is a person who after passing a qualifying examination has been engaged in employment in a resident medical capacity in one or more approved hospitals.

Employment in a "resident medical capacity" means employment in the practice of Medicine, Surgery, or Midwifery, where the person in question is resident in the hospital or institution where he is employed or conveniently near thereto, and is by the terms of his employment required to be so resident.

"Medicine" and "Surgery" include branches of, and specialties in, both these subjects.

General Information:

Para (1) Under the Medical Act, 1950, and regulations made thereunder by the General Medical Council, a newly medically qualified person *of the United Kingdom* cannot obtain "full registration" on or after 1st January, 1953 unless he or she produces proof of further experience after passing the qualifying examination.

Proof requires the production of a certificate showing that the applicant for full registration has given *satisfactory* service as a house officer in *recognised* "pre-registration" posts in *approved* hospitals or institutions for a period of 12 months. The applicant shall have been a house officer in medicine for 6 months and in surgery for 6 months. The applicant may count time as a house officer engaged in midwifery up to 6 months as time spent in medicine or surgery as he may elect. Time spent in employment in a health centre may under certain conditions count towards the 12 months requirement.

The pre-registration hospital appointments must be approved by a "Licensing Body", that is, any University or other body in the British Isles empowered to grant a qualifying diploma.

A list of recognised pre-registration house officer appointments in approved hospitals of the British Isles will be published periodically by the General Medical Council.

It is legally open to Licensing Bodies in the United Kingdom to approve hospitals or institutions in a Commonwealth or foreign country for the purpose of the requirements noted above and the General Medical Council list will in due course include such approved hospitals.

It is intended ultimately that recognised house officer appointments in the British Isles should be available at times of the year convenient to the requirements of applicants, newly qualified in the United Kingdom.

Para (2) *Overseas applicants for full registration who hold recognised diplomas granted in Commonwealth or foreign countries which have reciprocity with this country.*

On or after 1st January, 1953, such applicant for full registration must satisfy the General Medical Council

(*a*) that he has fulfilled the requirements noted in paragraph 1 above for persons qualified in the United Kingdom;

or

(*b*) that he has rendered satisfactory service in appointment(s) conferring experience of the practice of medicine and surgery, or medicine, surgery and midwifery, not less extensive than that noted in paragraph 1 above as required for persons qualified in the United Kingdom;

or

(*c*) that he has otherwise acquired experience "not less extensive than that required for persons qualified in the United Kingdom".

The General Medical Council is the sole authority for determining whether an overseas applicant for full registration has complied with the necessary requirements.

Para (3) An overseas applicant (as defined in paragraph 2) who is newly qualified and who wishes to obtain in due course *full registration* in the United Kingdom may apply for employment as a house officer in a recognised post in an approved hospital in the United Kingdom. After being selected for a pre-registration post he may then apply to the Registrar of the General Medical Council for *provisional* registration, supporting his application with a certificate from the hospital authority which appointed him. The form of certificate which must be completed is shown in the Appendix, a fee of 5 Guineas is payable for provisional registration.

At the end of a pre-registration appointment the practitioner must obtain a certificate from the hospital authority showing the duration of the period for which he was employed

and stating whether his service was satisfactory. The form of this certificate is not yet available.

After fulfilling the requirements noted in paragraph 3 above the *provisionally registered practitioner* may apply for *full registration* to the Registrar, General Medical Council. The additional fee for full registration in such case will be 6 Guineas.

Para (4) An overseas applicant (as defined in paragraph 2) who produces evidences satisfactory to the Registrar of the General Medical Council that, by virtue of intern (house officer) service for not less than 12 months, he has obtained full registration in the territory where his diploma was granted may apply for full registration in the United Kingdom, *provided the territory where he obtained his diploma has adopted, and the applicant's service was rendered under, a compulsory scheme of* INTERN (*House officer*) *service substantially equivalent to the scheme outlined in paragraph 1 above.*

Full registration, the fee for which is 11 Guineas, will likely be granted without delay in such cases

Para (5) An overseas applicant (as defined in paragraph 2) who has acquired experience for not less than 12 months as a house officer, but has not acquired that experience under a compulsory internship scheme (*vide* paragraph 4), may apply to the Registrar of the General Medical Council for *full* registration The applicant may have qualified in a territory where no internship scheme substantially equivalent to the United Kingdom scheme has been introduced or in a territory where such scheme has been introduced after his qualification. The General Medical Council will take into consideration evidence of satisfactory service for not less than 12 months in employment in a resident medical capacity in any hospital or institution which the Medical Council or other appropriate medical authority of the territory in which the applicant qualified may consider satisfactory for the purpose of acquiring the experience indicated in paragraph 1 above.

The fee for full registration is 11 Guineas.

Para (6) Other overseas applicants (as defined in paragraph 2) not falling within the classes of applicants included in paragraphs 3, 4 and 5 above, who may have acquired clinical experience after qualification in other ways, may apply for *full registration* to the Registrar of the General Medical Council.

Applicants may have had experience in non-recognised clinical appointments in hospitals or as Medical Officers in the Armed Forces or in general practice; or they may have had a combination of experience in two or more such capacities.

Applicants should give full information as to the evidence of experience on which they reply *well in advance of the date by which a decision is required.*

The fee for full registration is 11 Guineas.

APPENDIX

It is hereby certified that (name of applicant).....
.....of (address).....
.....has been selected for employment in a resident medical capacity (as defined in section 2 of the Medical Act 1950) in the undermentioned approved Hospital or institution.

(*Note:—The signature below should be that of an officer of a Board of Governors, Hospital Management Committee, or other employing body, authorised to act in this behalf*):

Title of Hospital or institution in full *in capital letters*
.....
Description of Post.....
Period of employment: FROM .....
TO .....
Signed .....
Official Position .....
Date .....

The above notes are based, at the date noted below, on the provisions of the Medical Act 1950 and of the regulations and memoranda of the General Medical Council and of the Ministry of Health. They are intended as a guide to overseas enquirers but the Empire Medical Advisory Bureau does not accept any responsibility for omissions or errors in the notes.

The first edition of the list of recognised posts in approved hospitals to be published by the General Medical Council (see paragraph 1) is expected to be ready about 30th September, 1952, at a cost of approximately five shillings, excluding postage. Application for copies should be made to the Registrar, General Medical Council, 44, Hallam Street, London, W. 1.

The General Medical Council is the sole authority for determining whether an overseas applicant for full registration has complied with the necessary requirements.

Applications for registration made to the General Medical Council before 1st January 1953 are governed by the existing regulations.

NOTES AND NEWS

MINES ACT, 1952 (XXXV OF 1952)

Silicosis and pneumoconiosis have been notified as diseases connected with mining operations *vide* Notification No. M-41 (23) 52, dated 21st July, 1952. Section 25 of the Mines Act referred to above, reads as follows:

Section 25 of Mines Act 1952 (XXXV of 1952):

"25. *Notice of Certain Diseases:* (1) Where any person employed in a mine contracts any disease notified by the Central Government in the Official Gazette as a disease connected with mining operations, the owner, agent or manager of the mine, as the case may be, shall send notice thereof to the Chief Inspector and to such other authorities, in such form and within such time as may be prescribed.

(2) If any medical practitioner attends on a person who is or has been employed in a mine and who is or is believed by the medical practitioner to be suffering from any disease notified under sub-section (1), the medical practitioner shall without delay send a report in writing to the Chief Inspector stating:

(*a*) the name and address of the patient.
(*b*) the disease from which the patient is or is believed to be suffering and
(*c*) the name and address of the mine in which the patient is or was last employed.

(3) Where the report under sub-section (2) is confirmed to the satisfaction of the Chief Inspector by the certificate of a certifying surgeon or otherwise that the person is suffering

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from a disease notified under sub-section (1), the Chief Inspector shall pay to the medical practitioner such fee as may be prescribed, and the fee so paid shall be recoverable as an arrear of land revenue from the owner, agent or manager of the mine in which the person contracted the disease.

(4) If any medical practitioner fails to comply with the provisions of sub-section (2), he shall be punishable with fine which may extend to fifty rupees."

AMENDMENT IN BENGAL DRUGS RULES

The following draft of further amendment is proposed to be made in the Bengal Drugs Rules, 1946, as amended subsequently. The draft will be taken into consideration on or after 25th January, 1953, and any objection or suggestion with respect thereto which may be received before that date by the Secretary to the Government of West Bengal, Medical and Public Health Dept., Medical Branch, will be duly considered:

In Schedule J to the said rules, *after* item 8 *add* the following item, namely:—

"9, Magnesium sulphate ..... The provisions of sub-clause (i) of clause (a) of section 18 of the Act to the following extent:—

Chloride present in the salt shall not exceed 0.12 per cent in the case of product prepared from sea water."

INDIAN ASSOCIATION OF PATHOLOGISTS

The 3rd annual conference of Indian Association of Pathologists will be held at Jaipur, Rajasthan, on November 23, 24, 25, 1952. Detailed information regarding this conference may be obtained from the Professor of Pathology, Medical College, Agra, U. P.

DR. A. D. MUKHARJI

Dr. A. D. Mukharji, Editor of "Your Health" and "Journal of the Indian Medical Association", who is also the Deputy Minister of Health, West Bengal, is one of the two official delegates of the Association to the Sixth General Assembly of the World Medical Association which was in session in the Parliament Building in Athens, from October 11 to October 17, 1952. Dr. Mukharji was also invited to attend the Third Annual Meeting of the Medical Editors of the World at Athens, held on October 17. The other official delegate of the Association who attended was Dr. S. C. Sen, Hony. General Secretary, Indian Medical Association, Delhi (also Assistant Secretary of W. M. A., Asia).

Dr. Mukharji after leaving Athens on October 18, would proceed to Rome, Munich, Vienna, Frankfurt, Stuttgart, Stockholm, Oslo and London. He is scheduled to reach Paris from London on November 11 from where he will go to Geneva and some other cities of Switzerland. He will study medical and hospital administration as also arrangements for medical relief, public health, medical education and medical research in those countries. Dr. Mukharji is expected to return to Calcutta by November 25.

IMPORTANT WHO POSTS CREATED

The World Health Organisation has created an important series of new posts of "Area Representatives" in most of the capitals of WHO'S South-East Asia Region. Area representatives have already been appointed in Ceylon, Burma and Indonesia, and recruitment is proceeding for Thailand. The question of an Area Representative for India, where WHO already has a Regional office, is understood to be still under consideration.

The principal function of WHO'S Area Representatives will be to assist national health services to integrate the rapidly increasing volume of international health assistance now available from various sources into a comprehensive national health programme appropriate to each country's capacity to absorb outside help.

WHO Area Representatives will also co-operate with national health services in planning the development or expansion of projects for which governments have requested WHO assistance in the fields of malaria, tuberculosis, yaws and venereal infections, nursing training, medical education, nutrition, maternal and child health, and the control of communicable diseases such as leprosy, plague, filariasis, etc., etc.

The presence of WHO Area Representatives in a country will involve no additional expense for national governments. —*WHO Release.*

CAMPAIGN AGAINST SYPHILIS IN HIMALAYAN FOOTHILLS

A World Health Organisation demonstration of modern syphilis treatment in the foothills of the Himalayas has indicated that, despite primitive conditions, "it is possible to control venereal diseases successfully" in an under-developed area, "keeping within the financial and medical resources of the country, and without offending the susceptibilities of the population."

A team was sent to Simla, Himachal Pradesh province of India, in May, 1949, to aid in a VD control campaign organised by health services of the province. After surveying the rate of infection, the team chose the Ghund district—a ridge at an elevation of 4,100 to 8,615 feet—for the demonstration. In one of the villages of this district, the team found, three-fourths of the families were affected by syphilis.

After treating syphilis patients with single injections of a penicillin preparation, the team returned twice at six-month intervals to check results. Although many of the inhabitants would not agree to new blood tests, the team found from the report of the head of the dispensary in the region that the campaign had lessened infection in the district.

Only about 12 new cases of syphilis in the past 12 months as against 66 in the six months preceding the treatment, were detected.

From their experiences the team concluded that "large groups of people may be assembled and successfully treated even in isolated and under-developed rural areas..... A team consisting of one or two clinicians, one serologist, one nurse, one laboratory technician and one clerk can examine and treat up to 350 persons a day—provided they have the support of the local authorities."—*WHO Release.*

SYNTHETIC RICE WITH BETTER FLAVOUR AND MORE VITAMINS

Synthetic rice from root of a weed is claimed to have been developed by Prof. Manindra Guha, head of the Department of Physical Sciences at the Huntington College (Indiana). The synthetic rice looks much like rice and can be cooked much the same as "minute" rice. The synthetic rice is cooked during the processing and needs only to be reheated.

Prof. Guha who is now in the United States for more than thirty years hails from Chittagong. He has developed

this synthetic rice from a weed known as folga which grows in abundant quantity in India and Pakistan. The folga is a tall perennial weed that grows abundantly in sandy and marshy areas. The root is very nourishing.

The process perfected by Prof. Guha has resulted in a food that looks exactly like grains of rice. It has better flavour. Moreover, it is possible to fortify it with any desired amount of vitamins.

The problem of getting the synthetic weed into production, now that the process has been developed, is largely an engineering one.

The rice synthesis is accomplished by machinery which pares the skin from the roots after a centrifugal washer has eliminated the sand. Another machine grinds it. It then is reduced to powder. Heating it permits forcing a paste through plastic extrusion dies. The process completed it looks exactly like grains of rice.

Both India and Pakistan Embassies have been informed of the developments and they have displayed definite interest in getting a synthetic form of rice to supplement the normal amounts produced by farmers in the countries.—*A. B. Patrika.*

ASSOCIATION OF MILITARY SURGEONS OF UNITED STATES

The fifty-ninth annual meeting of the association will be held at the Statler Hotel in Washington D.C., on November 17, 18 and 19, 1952. Invitations have been issued to all the principal nations of the world including India, to send the chiefs of medical services of Army, Navy and Air Force.

The Association of Military Surgeons was founded in 1891 and includes amongst its members, many of the world's most eminent military physicians.

The programme of this year's function includes the presentation and discussion of scientific papers, elaborate displays and technical exhibits illustrating the latest advances in military medical science.

A special convocation will be held on the 19th November when each delegate present from the different countries will be decorated with the medal and ribbon of the society and be conferred with honorary membership in the Association. On November 20 and 21 an international clinical symposium has been arranged for the visitors from abroad. The Association is expecting to have the largest possible number of representatives in Washington, this year.

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors

FUTURE OF LABORATORY MEDICINE HANGING IN THE BALANCE

SIR,—The sum and substance of the letter of Dr. T. V. Swamy under the above heading is that ill-equipped clinical laboratories are growing like mushrooms in every town and thereby public interest is suffering and therefore Government should introduce licensing system to control this. But to my mind the public will be most benefited if every medical practitioner can afford to have a microscope of his own to do routine microscopical investigation of his own patient. Thereby you can prevent your patient spending his last farthing on investigation alone before the actual treatment starts. The equipment necessary for carrying out the routine microscopical work, *viz.*, routine examination of urine, of stool for ova cyst etc., of blood for m.p. or total and differential count, are simple and every medical practitioner should know how to do it. I think that a medical practitioner should be encouraged to equip himself with a microscope in the same manner as he keeps a stethoscope. For serological tests like W.R., Widal, etc., and for culture well-equipped clinical laboratories in district towns may be maintained by the Government. I am, etc.

Silchar.

N. N. DAS,
L.M.P., D.P.H. & BY.

INTESTINAL MYIASES

SIR,—"The ingestion of or the infestation of the intestinal canal with the diptera eggs or larvæ mostly of the coprida beetle by the intake of dirty food or earth and probably metamorphosis of such eggs or larvæ in the intestinal canal and ultimately passing out of the adult diptera living or dead with the stools and the living one sometimes flying away" is called intestinal myiases. Such condition is more common now-a-days amongst the children in and around Calcutta.

Children are common victims. It is commonly seen in East Bengal but with the influx of East Bengal people, it is now seen here mostly in children. There is manifestation of vague intestinal disturbances, violent abdominal cramps, intractable diarrhœa or dysentery, loss of appetite, sometimes fever and malaise. This condition persists for some time inspite of all treatment. But minute inspection of daily stools of the children will reveal the passing out of adult living diptera commonly coprida beetles which fly away. Sometimes the dead adult diptera passes with the stools. When all the diptera come out with the stools, intestinal symptoms abate and general condition improves. Microscopic examination of the stool will not reveal the presence of diptera in egg or larval or pupal form. Careful and repeated microscopic examination of the stools will reveal the presence of the adult diptera living or dead when the diagnosis of intestinal myiases is established, otherwise, it is very difficult to do so.

Symptomatic treatment is carried out. There is no specific treatment for intestinal myiases so far. There is some controversial opinion as to the metamorphosis of the diptera inside the intestinal canal, but it is evident that adult diptera do come out with the stools of children suffering from intestinal disturbances.

At present intestinal myiases is more common amongst the children of the refugees from East Pakistan but some cases are also encountered amongst the children of the domiciled people of West Bengal. I would like to emphasise careful and repeated microscopic examinations of stools of children suffering from intestinal disturbances for the presence of adult living or dead diptera. The intestinal myiases amongst children by coprida beetle or other diptera should be properly investigated for the sources of infection and mode of infestation especially the colonies of the refugees in or around Calcutta to prevent the spread of it as it is common in the rainy season. I got four cases of intestinal myiases in this locality and some of my colleagues also got such cases. Local members of the profession will be interested to know that Dr. S. M. Ghosh, Professor of Medical Entomology, Calcutta School of Tropical Medicine has kindly given his verbal con-

sent to investigate such cases if reported and render other possible help for which I beg to thank him. I am, etc.

Modern Clinical Laboratory,
Dum Dum Road,
Calcutta 30.

S. C. SENGUPTA,
L.M.P., D.T.M.

INTRAVENOUS IRON

SIR,—In the "your questions" column (*J. Indian M. A.*, **21**: 498, 1952) one of the colleagues has raised the issue, that it is very difficult to use I.V. iron in small quantities. I agree though the colour of I.V. iron is almost black while blood is red, no difficulty is felt while giving intravenous iron. But I have found from experience that while using small quantities of the intravenous iron, the moment the blood gets into the barrel of a syringe fully loaded with the dose, it increases the volume of the fluid inside and gives the piston a jerk. This delicate jerk, if detected in time, saves one from even looking at the contents of the barrel, and makes him sure that he is in the vein and further operation can be carried out with confidence.

This delicate jerk has been my indicator and I had never to regret in my practice. I am etc.

22-8-1952,
P.O. Dehra Gopipur.

CHAMAN LAL TALWAR, M.B.B.S.

REVIEWS

THE CONTROL OF COMMUNICABLE DISEASES—By Hugh Paul, M.D., D.P.H., Pp. 526 with 95 tables and 30 graphical representations. Published by Harvey & Blythe Ltd., London W. C. 2. February, 1952. Price 55 sh.

Epidemiology being still an emergent subject in public health is not generally understood equally in all countries as regards its scope and functions. Confined originally to the study of infectious diseases only, the subject has gradually widened its scope and has now developed into a distinct discipline dealing with the total situation, and includes study and analysis of the various biological, social, economic, historical, geographical and physical factors and assessment of their relative significance with a view to design the methods of public health most suited to the circumstances of the community, which the public health administrator may effectively practise. However, communicable diseases being its major concern a greater part of epidemiology consists of their study including methods of prevention and control.

No satisfactory text-book written and designed according to the viewpoints, stated above, has so far been available, the information lying scattered in various books, reports, journals and periodicals. Dr. Paul is, therefore, to be congratulated for his attempt to fulfil this want to a large extent by bringing out the book entitled "The Control of Communicable Diseases" which should bid for a good reception. Judging from the contents and manner of presentation it might appear that the title of "Communicable Diseases and their Control" would have been more apt but it should also be admitted that a thorough discussion on the existing knowledge of all the factors operating in the production and propagation of a disease should precede the recommendation of the appropriate control measures.

The contents are divided into seven sections with an interesting prologue and an epilogue and 95 tabular and 30 graphical representations, giving a lote of information. The book is particularly enriched by a thoughtful and instructive foreword by Professor G. S. Wilson of London. The interesting feature of the work is the grouping of diseases under five heads, viz., household diseases, epidemic scourges, diseases associated with food and water, the neurotrophic infections and the insect foe, which, though novel in its own way, is not apparently strictly scientific, being based partly on epidemiological and partly on clinicopathological features. On the other hand, the plan of writing each disease is more or less arranged in accordance with the epidemiological factors, closely approximating the abridged plan adopted by the Calcutta school of epidemiologists.[1] The essential feature of modern epidemiology being the application of scientific technique in the study of diseases, the inclusion of cancer within the scope of epidemiological studies needs no apology as of accidents, coronary disease, diabetes, mental and occupational diseases etc.

Of the thirty communicable diseases handled by the author he has taken considerable pains in dealing more extensively with diseases like diphtheria, smallpox, tuberculosis, poliomyelitis, enteric infections and food poisoning. Although most of them have been selected and discussed with a local bias and the Indian students will miss a few of the diseases of special interest to the Indian public health, such as, hookworm, kalaazar, filariasis, leprosy, rabies, plague, V.D. other than syphilis, epidemic dropsy, and to a great extent, malaria and cholera (being briefly described), there are enough facts and features in the description of the individual endemic or epidemic diseases of common interest which are required for the understanding of the special features of these diseases and of the general principles of epidemiology and control.

As natural, certain amount of personal bias has crept in while expressing opinion regarding some points like the efficacy of smallpox vaccination and so on, to which others may not wholly subscribe. But on the whole, it is a commendable piece of work, almost new in adventure, fairly balanced and should prove useful to the students, practitioners and public health workers, and none the less to the teachers and teaching institutions. The style is easy and simple, the printing is in bold clear type and, for a first edition, mistakes are comparatively few, though present. With increasing emphasis on the social and preventive fields, a book like this should be of immense value to all for the proper understanding of modern medicine.

S. C. S.

ANNUAL REPORT OF THE CALCUTTA SCHOOL OF TROPICAL MEDICINE AND THE CARMICHAEL HOSPITAL FOR TROPICAL DISEASES 1948-50.

The report covers a period of three years. It is gratifying to learn that apart from teaching students for the D.T.M. and the L.T.M. courses, the institute has undertaken researches on many of the tropical diseases *e.g.*, Malaria, Typhus, Typhoid, Kalaazar, Filariasis, Cholera, Epidemic Dropsy, Leprosy, Blood Diseases etc. As would be appropriate, a large number of chemotherapeutic drugs and antibiotics were studied to find out whether they could be profitably used in some of these tropical diseases. The investigations, as it appears from the report, were conducted under the able guidance of the team of experienced research

1. The Teaching of Epidemiology in India—R. B. Lal & S. C. Seal—*Indian M. Gaz.*, **81**: 261, 1946.

workers who happen to be in the staff of the school. Valuable data have been made available in the publication which may with great profit be utilized by workers in these fields. The reports of eight professors and nine research departments are incorporated in detail besides the reports of the Director of the School, the Superintendent of the Carmichael Hospitals and the Superintendent, Pasteur Institute.

The School conducted classes for the D.T.M. and the L.T.M. courses. Qualified physicians came for these courses not only from West Bengal and several Indian States but also from foreign countries *e.g.*, Burma, Siam, Malaya etc. 149 students were awarded Diploma in Tropical Medicine and 65, the Licentiate in Tropical Medicine, during these three years. Dr. Miller from Canada and Dr. Gilmore deputed from the World Health Organization also came out to conduct investigations at the school.

Four members of the staff were given the opportunity of visiting foreign study centres and four members of the staff were elected Fellows of the National Institute of Sciences. Two post-graduate students were admitted to the Doctorate of Medicine of the Calcutta University.

During these 3 years, 3,853 patients were treated in the indoor wards, and 2,69,662 patients at the out-patients clinics of the hospitals attached to the school.

The principal sources of income were from the West Bengal Government, the Endowment Fund, the Indian Research Fund Association (now Indian Council of Medical Research) and several research fellowships. We would like to put here some portions of the Director's comment under the section "Endowment Fund"—

"It is however difficult in these days of high cost of living to fulfil all the obligations that the fund had so far met ever since the inception of the school, without the resources of the fund being substiantially increased. To this end appeals for raising the fund have been made to various firms and organisations and it is hoped that generous contributions will be forthcoming not only to maintain various humanitarian activities in progress but also for furtherance of research."

The report of the Superintendent, Pasteur Institute, reveals that during the 3 years under review, 12,309 patients attended and 3,700 patients were treated at the centre.

At the end of the report is a list of scientific papers published by the members of the staff during the year 1948-50.

S. F. A. CATALOGUE OF MEDICAL FILMS—Published by Harvey & Blythe Ltd.; 212, Shaftesbury Avenue, London W. C. 2. May 1952. Price 15 sh. net.

Cinematographic films have, in recent years, come to occupy a very important place in the teaching of students as well as disseminating important advances in the medical science. In 1918 a Catalogue of medical films was published on behalf of the Royal Society of Medicine and Scientific Films Association. The present 1952 issue of the Catalogue of Medical Films is a revised and enlarged edition of the previous one. This is a very useful book of reference for any medical college, medical association and other public bodies who may have occasion to use films for medical teaching and demonstrations. The medical films available in U.K. have been catalogued under a fairly exhaustive list of subjects which makes it very easy for anyone handling this catalogue to look up and find the proper list of the subject he wants. In addition there is at the end of book an index of the film-titles which serve as a cross reference and further helps to find out the film of which the title only in known. There is also an appendix, covering four pages, giving a list of films which have been notified to the S.F.A. after the book had gone to the press. This present volume is indeed the result of an admirable attempt. It classifies listing of films available for demonstration to practitioners as well as medical students. Although it has been stated that the work is far from complete, yet the book gives a very valuable amount of information about many films which have been either appraised by the appropriate committee as well as about many other films for which a personal review has been filed. The book should be in the hands of all authorities who desire to make use of the medical films for the benefit of students and practitioners.

AIDS TO BIOLOGY—By R. G. Neill, M.A. Published by Bailliere, Tindall & Cox., 7 & 8 Henrietta Street; London, W. C. 2. Pp. 238, with 21 figures. Third edition, 1952. Price 6 sh. net.

This book is the third edition of a member of the popular "Aids" series. The book covers the subjects under the group of Biology in a fairly comprehensive way as far as is permitted in the limited space available for an "Aid" book. This edition, published in 1952, has been called for within four years of its previous one, which fact alone speaks volumes for its popularity. The book has been made fairly representative of up-to-date information in the subjects grouped under Biology. The paper, printing, binding and get-up are very good. One would desire a larger numbers of diagrams or figures to be incorporated in the text but perhaps space forbids a wider use of these. The book should serve a very useful purpose for students appearing for examinations, as well as a small handbook for quick revision work.

OBITUARY

DR. M. G. KINI, M.C., M.B., M.CH. (ORTH.), F.R.C.S. (EDIN.), F.A.C.S., F.I.C.S., F.R.S. (EDIN.), F.N.I., F.A.S.C.

Dr. M. G. Kini, one of India's foremost authorities on poliomyelitis died on 22nd August 1952 at his residence in Bombay after a heart attack. He was 60.

Dr. Kini was associated with the Orthopædic Hospital in Bombay for the past five years. He came to Bombay from Madras at the express desire of the Society for rehabilitation of crippled children and was mainly responsible for organising the hospital.

Dr. Kini was Superintendent and Professor of Surgery at the Stanley Medical College, Madras. He retired from service five years ago. A member of the Indian Medical Association, Dr. Kini was a contributor to this Journal. An article Tuberculosis of the Ankle-joint by him appears elsewhere in this issue.

RAJPUTANA MEDICAL CONFERENCE, JAIPUR

The 2nd Rajputana Medical Conference will be held in Jaipur on 5th, 6th & 7th December 1952.
All correspondence regarding the Conference may be addressed to the Honorary Secretary, Rajputana Provincial Branch of I.M.A., Kishenpole Bazar, Jaipur, Rajasthan State.

SUPPLEMENT

Journal of the Indian Medical Association

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XVIII ANDHRA PROVINCIAL MEDICAL CONFERENCE

The eighteenth Andhra Provincial Medical Conference was held on 20.5.52 at 9 a.m. in a well decorated pandal in the premises of the Taluq High School, Tenali. After the national flag was hoisted by Mr. N. Venkatrao, the conference commenced with a prayer by Mrs. K. Pushpavati Devi, Dr. K. Venkatrayudu Choudary, the chairman of the Reception Commitee welcomed the delegates and the guests with a suitable speech, in which he referred to the problems of Health of School Children, Housing, Health Education of the masses, Families Planning, Medical Education of to-day, Rural Medical Relief, Refresher courses for doctors, Indigenous Systems of medicines and Proprietary preparations. He described the present poor condition of the peoples' health, explained the causes and offered possible solutions.

The conference was inaugurated by Mr. A. B. Shetty, Minister of Health, Government of Madras. Due to the unavoidable absence of Dr. U. Krishna Rao, Minister of Industries, Madras, Dr. T. S. Tirumurti, the president of the I.M.A. declared open the exhibition.

The scientific session was inaugurated by Dr. M. V. Krishna Rao, Minister of Education, Government of Madras and presided over by Dr. D. Narayana Rao. In the scientific session, Dr. Miss C. Ratnavati spoke on "The Cytological test in the diagnosis of Cancer of the Uterus", Dr. Miss I. A. Kantamma spoke on Intravenous Iron in the treatment of Anæmia and Dr. R. Mahadevan, on "Surgery of Heart and Great Vessels". There was also a symposium on Tuberculosis and Dr. K. N. Rao dealt on the Surgical Aspect, Dr. A. Bhavanarayana Rao on Problems in diagnosis, Dr. K. S. Ranganathan on B. C. G. Vaccination and Drs. K. S. Raju and P. Ramamurthi on Hæmoptysis. Interesting films were also shown.

The President of the conference in course of his address, said,

It is to be regretted that there are still a large number of practitioners in Andhra Desa who have not become members of the I. M. A. I feel that unless each branch of this All-India Organisation is fully consolidated it will not carry the weight and influence as the mouthpiece of the profession and as a body with whom the Government should negotiate when major decisions are to be made in medical and health matters.

FALL IN PRICES

It is a well-known fact that there is enormous inflation in our country. I am mentioning this because the continued condition of inflation have a bearing on the health and living conditions of the people. On behalf of the common man, I say with all the emphasis I can command that we want a thorough and substantial fall in prices of all commodities including food, and the sooner this is achieved by Governmental interference the better for the people.

THE FIVE YEAR PLAN

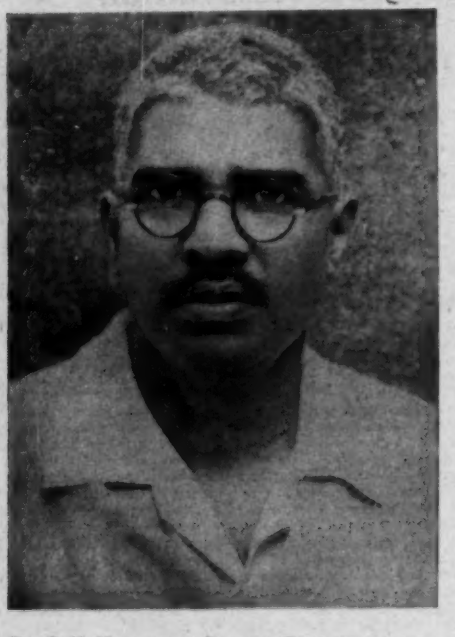
The Government of India have launched the First Five Year Plan beginning from 1951 and ending with 1956, and this multi-pronged drive for national development has won the appreciation of leading foreign countries. The fundamental items in the plan are increasing the food production and raw materials for industrial development. This being so the expenditure on other items including health was very much curtailed. Notable among the schemes for health are a Penicillin factory, a D. D. T. factory, Family Planning and improvement of Vital Statistics. An all-India medical institute for post-graduate training and institutions for nurses and midwives are to be set up at Delhi. The W. H. O. and the UNICEF are aiding work in the campaigns against T. B., Malaria, Venereal diseases and Leprosy. The State Governments have their own programmes but details are not available. Though a substantial amount is not set apart for health schemes, it is to be hoped that under the plan better living conditions will be secured for the masses, so that their health also is indirectly improved.

Rural Health:—With regard to Rural Health several good suggestions have been made in the Plan, for example, water supply and drainage, medicine boxes in charge of auxiliary personnel, maternity and child welfare, health education and health units, etc. The co-operation of voluntary organisations was also mentioned. I am afraid that in spite of the best intentions of those responsible for planning, these suggestions rather than schemes for Rural Health are not likely to bear fruit appreciably. The principal reason for this is that the network of State administration with the exception of the Revenue Department has not spread to the villages. In spite of the existence of a separate Rural Welfare department a sufficient amount of the State income is not spent on the villages. Quasi-official bodies like the local boards and Panchayats are incapable of turning out efficient work in the villages. These bodies are responsible for party factions, animosities and even bloodshed in the villages and the moneys are generally mismanaged. I am sure that unofficial bodies, even including the Congress, and the quasi-official bodies are not a solution for sometime to come in this all-important national problem. It is only the contact of responsible State officials with the villagers that can bring a speedy amelioration of the pressing needs of the villages.

Community Projects: In connection with the promotion of food production and development of rural areas the Planning Commission have envisaged an all-India scheme of Community Projects which will cover about 16 thousand villages at a cost of about Rs. 388 crores. These projects are to be taken up under the recent Indo-American Technical Co-operation Agreement. The programme includes 48 project areas, each covering about 300 villages. In Andhra, the Cocanada-Peddapuram area and an area in the district of Cuddapah have been selected. The activities in these projects cover all aspects of development including agricultural and rural development, cottage and small scale industries, education, health, housing, reclamation of cultivable waste land, encouragement of village arts and crafts, animal husbandry, extension and improvement of communications, etc. The projects are to be manned by an exclusive development staff and the details so far given about these have greatly roused the curiosity of the public and good results in increased food production and vastly improved living conditions are expected in the particular areas.

River-valley Projects:—These naturally form the most important of the items on the Five-Year Plan and a sum of Rs. 1,840 crores was originally set apart for them. Work is already going ahead in connection with the Bhakra, Khosi, Damodar Valley and Hirakud Dam projects, and new projects are to be started in this year. One major project is to be taken up for Madras State. With the implementation of the Colombo Plan a sum of Rs. 2,300 crores will be spent on these major projects and it is hoped that by the year 1956 the food crisis in India will be mostly solved. With regard to the major project in the Madras State, I hope and trust the Khosla Committee will recommend the Nandikonda and Pulichintala projects which are beneficial to the peoples of Hyderabad and

Andhra areas. The Krishna-Pennar project to which undue prominence was given by the Madras Government is in fact an unworkable scheme and will submerge several hundred villages and lakhs of acres of land now in cultivation and will do more harm than good to the people of Rayalaseema. To spend a sum of Rs. 150 crores or more on this project merely



DR. G. V. HANUMANTHA RAO, THE PRESIDENT OF THE CONFERENCE

to bring fresh water to Madras will be a colossal drain on national finances without a commensurate increase in food production. No one denies that there is water scarcity in Madras, but it can be got over by much less costly methods and I hope that a right decision will be taken. The Madras Government I mean the Caretaker Ministry—had recently recommended an eye-wash scheme of the Ramapadasagar project with an estimated expenditure of a little over Rs. 1 crore for the first year of the Plan. I appeal to the Madras Government to have a more realistic approach towards this very important project and to recommend its inclusion in the Five Year Plan with appropriate finances for its execution.

The river valley and community projects will vastly increase the food production and industries and many impoverished villages are likely to be greatly benefited. I hope the development staff in the model community projects will be maintained on a permanent basis and I suggest that the State Rural Development Department should be much better financed and manned than at present and that all branches of State administration, *viz.*, social welfare, education, hygiene and health, industries, communications and police, etc., will be incorporated in a parallel and exclusive Rural Government.

Medical Education

In my address last year I pointed out the great need for the establishment of more medical colleges in our State. The State Government have not announced their health schemes in the Five Year Plan and I hope that medical education will be given the due attention it deserves. The Guntur Medical College must be made full fledged institution and a college must be started at Madura. There is need even for more medical colleges, one in Rayalaseema and another in South Kanara. Till more medical colleges are brought into existence, I suggest that a double-shift system be introduced in the existing ones, as a temporary measure, so that more doctors could be turned out in these institutions. Some eminent persons have raised an objection to the double shift system. But taking the resources of the Government and the need for medical attention into consideration, I would strongly suggest this arrangement at a moderate expenditure incurred by the Government.

Selection of Students and Recruitment to Services

With regard to admission of students in technical institutions and also in the matter of appointments, the Madras Government are very reluctant to obey the Supreme Court Ruling and want to stick on to the Communal G. O. or circumvent the Ruling by other methods. I hope that the Madras Government will respect the Supreme Court Ruling and give consideration to merit irrespective of caste in the interests of efficiency. It is a deplorable fact that in the selection of students into professional colleges in July 1951 the injustice done to a particular community was still perpetrated and let us hope that the selection in future will be above criticism. This also applies to the selection of candidates for appointments by the Public Services Commission where marks are given to candidates at interviews. These methods require an overhauling, and as this is not being done, I request the Central Government to intervene and enforce the adoption of a uniform method in the various States. The argument that there are certain factors or circumstances peculiar to Madras does not hold water in the interests of efficiency. The enormous extent of corruption particularly in certain services in this State brings no credit to the Government and is the cumulative result of a policy they had been pursuing in professional education and appointments down to the lowest cadre.

Salaries of Medical Personnel

In Madras State the salaries of medical personnel are very low compared to the salaries obtaining in many States in upper India. The scale of Assistant Surgeons must be raised to Rs. 400/- basic with the maximum fixed at Rs. 800/-, that of the Civil Surgeons be 800/- basic with the maximum at Rs. 1,200/- and that of Professors in the clinical and non-clinical departments to Rs. 1,000/- with maximum at Rs. 1,500/-. The Assistant Professors must also have commensurate pay for loss of private practice. The pay of Demonstrators should be raised to that of Asst. Surgeons and the demonstrators must be given a permanent cadre with opportunity of promotion to higher ranks in the department. I request the Central Government to enforce a uniform scale of pay for all categories of medical personnel in all the States. In this connection I recall the speech of Rajkumari Amrit Kaur made recently at Amritsar in which she stated "I am quite sure that all Government will have to provide adequate emolutions to whole-time teachers of all categories in our medical colleges, so that the ablest in the profession may be drawn to the fields of research and teaching. . . . . while the cost of living has increased by 300 to 400 per cent the salaries of professors in the medical colleges remain as they were before." I have to point out the anomaly that in Madras State whereas the non-clinical professors were paid a basic pay of Rs. 900/- before the war, they are paid Rs. 600/- after the war. The Government must open their eyes to this gross injustice and ameliorate the living conditions of these professors. This must be done urgently to relieve them of their financial embarrassment.

Medical Relief in the State

The medical relief available in the hospitals under quasi-official bodies, the local boards and municipalities is very inadequate and there is no proper organisation as well as proper remuneration for medical and auxiliary personnel in these hospitals. I strongly recommend to the Government that these institutions must be provincialised under the control of the Director of Medical Services, so that they can be improved and uniformity in pay and other emoluments is established for the personnel. This may require expansion of the office of the D. M. S. and it is well worth it. I also

suggest a rotation of medical personnel in Government service once in three or five years from towns to mofussil areas, so that the people in the latter may also be benefited by the services of experts. This will also allay the fears of young graduates who are posted to the Primary Health Centres that they will have to rot there only. The setting up of a T. B. Sanatorium in each district must also be taken up by the Government as part of Five Year Plan for the State. I have to point out that most of the Andhra districts are neglected and the T. B. scourge is rampant and unattended to in these districts. Other State measures like the B. C. G. vaccination, anti-malarial and anti-leprosy work, cancer clinics, etc., must be made available to the districts. I hope that the Government will also realise the importance of school medical inspection and include it in the Five Year Plan. The State must appoint specialist officers to visit the school and supervise the work of the school medical officer. If the future citizens are to be healthy and strong there should be no institution without the proper amenities for physical education.

World Health Organisation

It is a welcome programme of aid to India for 1952 as announced in February last at New Delhi by the Director General of W. H. O. that the W. H. O. proposed to spend over 1,700,000 dollars in India during 1952 for continuation of its work on Malaria control, Anti-tuberculosis campaign, B. C. G. vaccine, and in the manufacture of penicillin and D. D. T. Another important development expected in 1952 he added would be the strengthening and integration of the existing maternal and child health facilities with a view to providing all-round training to an advanced stage in urban and rural public health work, nursing of children, midwifery and health visiting in Delhi. The ultimate aim would be to open similar integrated training centres for maternal and child health work in Madras, Hyderabad and other centres also. I suggest that a Blood Group Reference Laboratory may be set up in our country and that W. H. O. be requested to help in its set up. Our problems of health are very great and we are lacking in sufficient technical personnel and necessary funds and I hope that international organisations will render us every possible help.

Control and Manufacture of Drugs

It is a matter beyond contradiction that without an adequate supply of medicines of standard quality, the health services cannot function properly. The Government have already taken steps to ensure that the medicines are actually up to the declared standards. They have also liberalised imports and are encouraging the indigenous manufacture of drugs. The Drug Act of 1940 was put into operation in April, 1947. The necessary machinery for drug control as provided in the Act has been brought into being in the Centre and in the States, and action is being taken against misbranded and substandard drugs. Samples of drugs which are imported into India are checked in the Central Drug Laboratory. Under the guidance of the Central Government all the part A States have adopted uniform rules under the Drug Act and in the very near future part B States are also expected to fall in line.

To make more quantities of drugs available to the public, the import of penicillin, insulin, sulpha drugs, arsenicals, etc., was liberalised by the Government by the grant of free licences in May, 1950. The Import Duty on D. D. T. has been abolished, so as not to hold up anti-malarial work in the various regions of India. Regarding the actual production of drugs in India, the Central Government is implementing a scheme for the manufacture of penicillin at Poona, and the Government of Bombay for the production of D. D. T. West Bengal and Madras States which own cinchona plantations produce about 100,000 pounds of quinine, the requirement of the country annually being 150,000 pounds. The Central Government is in consultation with these States on plans for increasing quinine production. The Haffkine Institute, Bombay, is manufacturing sulphathiozole on a commercial scale. It is reported to be equal to the best imported stuff. The Central Drug Research Institute is carrying on research work on certain medicinal plants used in Ayurveda and Unani systems of medicine. The Indian Council of Agricultural Research is working on a coordinated scheme for the cultivation of medicinal plants in Coimbatore Panchagani and Darjeeling. In a few years it is estimated that the drug industry in India will be fully nationalised and the now costly drugs will be made available at cheaper prices.

Indigenous Systems of Medicine

I have often expressed my views which also agree with those expressed by the I. M. A. and the Indian Medical Council that so far as State Medical Education is concerned the Modern Scientific Medicine is the only one to be adopted. The present paucity of qualified doctors automatically concedes the co-existence of physicians practising the indigenous systems of medicine. I again repeat what I said before that the indigenous systems are based on primitive studies of the human machine and that their diagnostic methods are obsolete. There is no doubt that there are several useful herbs and drugs in these ancient systems and some of which are stated to have wonderful medicinal value. It is gratifying that the Planning Commission have allotted sufficient funds for research into the indigenous systems. I hope that similar researches will be instituted by the various State Governments and that in course of time the drugs of proved therapeutic value and the principles of dietetics in these systems will be incorporated into modern medicine. Several practitioners of indigenous systems have expressed the view that the impartation of the methods of modern scientific methods for trainees in the indigenous systems will produce confusion in their minds and that this synthesis is better avoided. This view was long ago expressed by representative bodies of medical profession and now that it comes from the mouth of the Ayurvedic practitioner himself that the Government will do well to retrace their steps in imparting a synthesised course of medical education. It is also gratifying to note that a Provincial Register is to be maintained for practitioners of indigenous systems and rigorous steps must be taken to root out quackery. It is something funny to see an Ayurvedic practitioner carrying a stethoscope and an injection equipment in his kit and he is often using antibiotics and many other modern drugs with a scrappy knowledge of their usage. This hoax on the public must be put an end to by the Government immediately.

RESOLUTIONS PASSED AT THE CONFERENCE

The following resolutions were passed in the conference, besides condolence resolutions passed on account of the death of (1) Dr. U. Rama Rao; (2) Dr. B. Ramamurty; (3) Dr. B. Sankara Rao; (4) Dr. N. B. Subramanyam; (5) Dr. S. K. Hanumanth Rao; (6) Dr. Vijayasaradhi.

I. While reiterating the resolutions of previous conferences, the 18th Andhra Provincial Medical Conference urges the Government to open clinical courses in Guntur Medical College from July, 1952.

II. In view of the completion of the extension programme of the King George Hospital shortly this conference requests the Government of Madras to increase the admissions to Andhra Medical College, Visakhapatnam, to one hundred.

III. This conference urges the Government of Madras to provincialise all local Board Medical services and make them equal to Government services with regards to pay and prospects.

IV. This conference requests the Government of Madras to expand the honorary services to all taluq Hospitals, and in District Headquarters hospitals for surgeons and physicians also, and give an honorarium as in some other States.

V. This conference urges upon the Government of Madras the urgent necessity of State owned Tuberculosis sanatoria in Andhra Desa and requests the Government to open at least one in Andhra Desa.

VI. While reiterating the resolutions of the previous conferences this conference requests the Government to reserve at least ten per cent of the seats in Medical Colleges to children of Doctors in view of the fact that the doctors (who are in independent practice) will have to loose what all they have invested in their practice in the shape of equipment and the like.

VII. While reiterating the resolution of the previous conference this conference requests the Government of Madras

to reinstate all the civil Assistant Surgeons discharged on grounds of temporary service, in the vacant posts now advertised to be filled and only fill the remaining posts by the selection of new recruits.

VIII. This conference urges on the Government to select on merit the candidates for admission to Medical Colleges.

IX. This conference requests the Government to introduce medical inspection in all the schools in the State and also give medical relief to the staff and students of the Educational institutions on the lines of Health Insurance.

X. This conference requests the Government to supply Sankati instead of gruel at the relief centres as the people of the area are accustomed to Sankati and increase the supply of grain suitably.

XI. This conference requests the Government to increase the subsidy from Rs. 65/- per month to the bare minimum of Rs. 100/- per month and also order the District Board to invariably provide a servant and house rent and a minimum contingencies of Rs. 5/- per month to each Rural dispensary.

XII. This conference conveys its congratulations to the Madras students organisation and Madras city Branch, Indian Medical Association for taking the initiative in forming the Rayalaseema Citizens Rural Relief Committee with the Mayor of Madras as President.

XIII. This conference recommends to the Government of Madras to follow a progressive scheme of reclamation of the hyperendemic Malarial tracts in Andhra Desa, as is done in Wynad and started in Araku Valley.

XIV. This conference records its appreciation of the services of the Reception Committee of the 18th Andhra Provincial Medical Conference and of the members of the Tenali branch of I. M. A. for making the conference a success.

BRANCH NOTES

AMBALA CANTT. BRANCH—In a meeting of the branch, the members condoled the sad and untimely death of Dr. Hans Raj, who breathed his last due to an attack of coronary thrombosis at Bombay where he had gone for D. M. R. E. course.

BANARAS BRANCH—In a meeting of the branch, the members condoled the sad death of Dr. Shobha Ram who was one of the foundation members of the branch.

BANGALORE BRANCH—The annual meeting of the branch was held on the 30th and 31st of August, 1952. Dr. K. Rama Rao was in the chair. Office-bearers for the next year were elected with Dr. M. S. Mekhri as president and Drs. B. V. Ramaswami and T. Parthasarathy as secretaries. A symposium on Focal sepsis was held and the following members participated: (1) Dr. S. S. Jayaram on Fistula-in-ano; (2) Dr. M. S. Mekhri on "Eye Affections"; (3) Dr. N. S. Shroff on Dental Infections; (4) Dr. K. S. Subramaniam on Psychotherapy; (5) Dr. Mrs. Rathnamma Isaac on Puerperal Fevers; (6) Dr. K. N. Singaravelu on Investigations.

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A meeting of the branch was held on 22-9-52. Dr. N. S. Mekhri presided. Seventy-one members were present. Dr. T. Seshachalam spoke on some Aspects of medical practice.

BENGAL PROVINCIAL BRANCH—The fifth meeting of the Working Committee of the branch was held on 20-5-52. Nineteen members were present. The proceedings of the last meeting were confirmed. The formation of a new local branch with eleven members was approved. As the consideration of the reports of the Standing Committees were not completed, the house adjourned till 30-5-52.

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The adjourned fifth meeting was held on 30-5-52. Twelve members were present. The report of the Medical Education Standing Committee *re* New Set up in Calcutta Medical College were discussed and it was decided to release it for the press incorporating the suggested changes. The report on the Post Graduate Medical Education was approved. It was decided to hold the next rural conference at Tarakeswar on 25-5-52.

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The 6th meeting of the Working Committee was held on 7-8-52. Eighteen members were present. The proceedings of the last meeting were confirmed. The resolution of the Calcutta branch *re* Spurious Drugs was approved. The question of medical relief to the scarcity areas of West Bengal was discussed. The committee recommended the reorganisation of the Bengal Medical Relief Committee. The recommendations of the Sub-Committee *re* the draft rules of the I. M. A. (Central) were approved.

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The seventh meeting of the Working Committee was held on 11-9-52. Seventeen members were present. The reports of Standing Committees were approved. Dr. A. C. Ukil's suggestion that the amount received from the B. M. A. in West Bengal be utilised for organising more rural conferences and for more propaganda work in West Bengal was accepted. The house elected a committee for making arrangements for reception of Dr. Bauer. The Screening Committee in connection with some residents in U. S. A. and Canada was formed.

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The Bengal Provincial Branch appointed a Committee to consider the New Set-up in the Medical College, Calcutta. The Committee analysed the staff position of the Medical College and Hospitals in details and considered that any proposed alteration in the existing conditions may have three possible objectives, *viz.*: (1) better teaching; (2) better care of the patients and (3) co-ordination of medical research. In the background of the above three objectives the Committee discussed the advantages and disadvantages of the "New Set-up". The Committee made a detailed analysis of the existing condition and the condition that might arise due to the New Set-up and in its opinion, this new Set-up would not be able to improve the condition, rather worsen it.

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Regarding Post Graduate Medical Teaching in India, the Committee set up by the Bengal Provincial Branch, is of unanimous opinion that post graduate medical education can only flourish in the proper University atmosphere. The Bhore Committee also recommended that the post graduate medical education should be the responsibility of the University. The Indian Medical Council should be responsible for supervision, co-ordination and maintenance of the uniformity of standard. The Committee therefore views with regret and apprehensions the remark of the Hon'ble Health Minister at the opening ceremony of the All-India Medical Institute, that the Post Graduate Medical Education should be under the control of the Government of India, and thinks that it is unwarranted because of the decision against it being carried out by a majority of votes in the meeting of Indian Medical Council, presided over by herself.

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The second ordinary meeting of the Bengal Provincial Council for 1951-52 was held on 23-6-52 with Dr. J. C. Banerjee in the chair. Twenty members attended. The house adjourned after passing condolence resolutions on the death of (1) Dr. Krishna Chandra Chakraborty a member of the Working Committee of the Bengal Provincial Branch, (2) Dr. M. N. Ghosh of Raniganj and (3) Dr. U. P. Basu.

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The adjourned meeting of the second ordinary meeting of the Bengal Provincial Council was held on 5-7-52 with Dr. J. C. Banerjee in the chair. Thirty members were present. The business arising out of the proceedings of the last meeting was attended to. The accounts for the Commonwealth Medical Conference were scrutinised. The unrealisable amounts due from certain local branches were written off. Regarding issue of drug licence and representation of I. M. A. Garhbeta branch to the Garhbeta Thana Health Centre, it was decided to write to the D. H. Services and to Hony. General Secretary, I. M. A., New Delhi.

BERHAMPORE BRANCH—The annual meeting of the branch was held on 19-7-52. The annual report was read by

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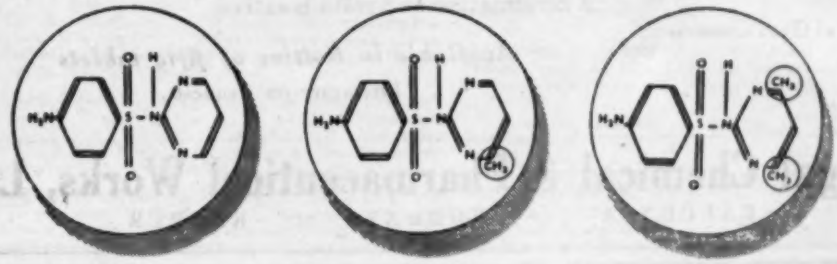

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the secretary and the audited accounts passed. The office bearers of the last year were unanimously elected to continue for current year.

BETTIAH BRANCH—A meeting of the branch was held on 17-8-52 with Dr. R. L. Banerjee in the chair. Nine members were present. The members condoled the death of Dr. R. P. Gupta, an ex-member of the branch. It was decided to hold the annual general meeting in the first week of November, 1952.

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A meeting of the branch was held on 7-9-52. Dr. R. L. Banerjee presided. Fourteen members were present. It was decided to invite the 13th Provincial Medical Conferenec at Bettiah in November, 1952. It was also decided to hold the annual general meeting of the branch on 26-10-52.

BHOWALI BRANCH—The seventh general meeting of the branch was held on 29-6-52. Dr. H. N. Saxena occupied the chair.

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The eighth general meeting was held on 10-8-52 with Dr. K. Chand in the chair. Eleven members were present. Dr. R. N. Singhal read a paper on "Selection of Diuretics".

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The ninth general meeting of the branch was held on 7-9-52, Dr. K. Chand was in the chair. Thirteen members were present. The election of the president was held. Since the number of papers read during the year was small, it was decided not to give any prize this year.

CACHAR BRANCH—A meeting of the branch was held on 30-8-52. Dr. S. C. Gupta presided. Dr. S. B. Dey read a paper on "Rabies" which was very interesting. The members deprecated the attempts that are being made in certain States to revive Licentiate training.

CHAIBASA BRANCH—A meeting of the branch was held on 18-5-52 with Dr. H. Rahman in the chair. Eighteen members were present. Two case notes regarding the effectiveness of Chloromycetin in Otorrhœa and Iridocyclitis were read by Dr. P. C. Sen.

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A meeting of the branch was held on 27-6-52. Twelve members were present. Dr. N. Hossain, president, submitted his resignation due to his transfer.

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A meeting of the branch was held on 27-7-52. Ten members were present. A paper on Glucose and its reaction was read by Dr. P. C. Sen.

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The second annual general meeting of the branch was held on 20-4-52. Lt.-Col. Najib Khan presided. Thirty-one members and seven invited doctors attended the meeting. Dr. Nazir Hossain, the chairman of the Reception Committee welcomed the members and the guests in a neat little speech. The president in course of his address said "Life over the globe" is changing rapidly and more so in India. The old values, ideas and idealogy are being challenged in every sphere of life; medicine is no exception to that challenge. In India, scientific medicine is facing challenge of three types. First and foremost is the challenge from the "changing phase of medicine". There is also a challenge from the reactionary element who want to revive ancient medicine of India. Last but not the least is the challenge from the vested interests of the Pharmaceutical Industry who want us to be agents for sale of their proprietary preparations.

The following scientific papers were read: (1) Jaundice by Dr. S. P. Mukherjee; (2) Splenic Anæmia by Dr. P. C. Sen; (3) Upper Motor Neurone affection due to acute Vitamin B deficiency by Dr. N. Barman.

COCHIN BRANCH—A meeting was held on 21-11-51. Demonstration of clinical cases was given by Drs. (Mrs.) Mary Antony, Urumese and V. B Mahammad.

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A meeting was held on 30-11-51. Demonstration of interesting cases was given by Drs. (Mrs.) Rema Bai A. Bhat, (Mrs.) Sridevi Krishnan and K. J. Abraham.

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A meeting was held on 14-12-51. Dr. S. S. Rao spoke on "Peptic Ulcer".

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A special meeting was held on 12-1-52 to accord welcome to Hon'ble Sri Rajkumari Amrit Kaur.

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A meeting was held on 25-1-52 to elect a secretary in place of Dr. S. S. Rao resigned.

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A meeting was held on 13-3-52. Dr. V. B. Muhammad gave a demonstration of clinical cases.

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A meeting was held on 5-4-52. Films on Construction of Plaster Caste and Elastoplast in Modern Surgery were exhibited by Col. J. I. H. Morris, of Messrs. T. J. Smith & Nephew, Ltd. (England).

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A meeting was held on 7-5-52. Dr. M. G. Kini spoke on "A plea for the organisation of a central orthopædic institution in India for training post-graduates in proventive and curative aspects of orthopædic diseases.

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A meeting was held on 17-5-52. Dr. A. V. Baliga spoke on "Impressions of the advancement of Surgery in other countries than India".

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A meeting was held on 31-5-52. Films were exhibited by Messrs. Squibb & Co., Ltd., on (*a*) Modern Nutrition (*b*) Penicillin in Medicine and Surgery (*c*) Anæmias.

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A meeting was held on 20-6-52. Dr. K. C. Paul spoke on "Diabetes".

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A meeting was held on 31-7-52. Interesting clinical cases were demonstrated by Dr. A. P. Fances.

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A meeting was held on 29-8-52. Dr. K. J. Abraham spoke on "Blood Bank".

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The annual meeting was held on 24-9-52. Office-bearers for 1952-53 were elected and demonstration of interesting cases was given by Dr. A. K. Menon and others.

COIMBATORE BRANCH—A meeting of the branch was held on 23-8-52 with Dr. I. Pitchai Robert in the chair. The members condoled the sad and sudden death of Dr. M. G. Kini. Dr. V. Ramalingaswami of the Nutritional Research Laboratories, Indian Council Medical Research gave an interesting talk on "Megaloblastic Anæmias".

DAVANGERE BRANCH—The report of the branch for 1951-52 shows that the 20th Mysore Medical Conference was held at Devangere under the auspices of this branch. Regular monthly meetings were held and clinical subjects discussed. Office bearers for 1952-53 were elected with Dr. K. S. Shadak-Sharappa as president and Dr. M. C. Nanjappa as secretary. Dr. V. N. Damodaran, a member of this branch left for America on a residential scholarship in Flaminghnm Union Hospital.

DHARWAR BRANCH—The annual meeting of the branch was held on 30-9-52 with Dr. S. M. Kurdikeri in the chair. Office-bearers for the year 1952-53 were elected with Dr. S. M. Kurdikeri as president and Dr. H. V. Upadhye as Secretary.

DUM DUM BRANCH—A general meeting of the branch was held on 7-9-52 with Dr. S. Bhattacharya in the chair. Twelve members were present. After the circulars from the Central and Provincial offices were considered, medical and public health matters concerning the local area and the municipalities were discussed. Dr. S. K. Bishnu, the secretary and Dr. B. Raychaudhury, the Jt. Hony. Secretary were requested to arrange scientific discussions in some of the monthly meetings.

FEROZEPORE BRANCH—A refresher course arranged for 4 days from 3-8-52 to 6-8-52 by the D. H. S., Punjab, was attended by all the members of the branch. A meeting of

the branch was held on 2-9-52 with Dr. Raja Ram Bhola in the chair. Fifteen members were present. Dr. Chowdhury, D. M. O., Northern Railway, spoke on Treatment of Fractures.

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An extraordinary meeting of the branch was held on 10-9-52 with Dr. Raja Ram Bhola. Twenty-one members were present. Col. R. N. Khosla, chairman of Family Planning Association spoke on the Organisation of Family Planning Clinics on a scientific line.

ERODE BRANCH—A clinical meeting of the branch was held with Dr. R. S K. Raman in the chair. Dr. N. Jogannathan, Specialist in Tuberculosis, spoke on the "Use and Abuse of Streptomycin". There was a good attendance of doctors. A discussion followed, in which Drs. M. N. Shenoy, T. S. Bhaskaran and P. N. R. Setty participated.

GHUGHUDANGA BRANCH—A meeting of the branch was held on 24-8-52. Dr. S. Sarker presided. Eleven members were present.

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A meeting of the branch was held on 14-9-52 with Dr. S. Sarker in the chair. Ten members were present. It was decided to hold the next annual meeting on 26-10-52.

GIRIDIH BRANCH—A tea party was organised on 7-9-52 to meet Dr. Imteyazuddian Ahmed (Patna) who was going abroad for higher studies.

JAGATDAL BRANCH—The annual meeting of the branch was held on 19-9-52. Dr. Satish Ch. Sarkar was elected the president and Dr. Phanindra Nath Ghosh, the secretary for 1952-53. The annual report for 1951-52 shows that 5 Executive meetings and one special meeting were held during the year. Six clinical meetings were also held. Four members of the branch attended the refresher courses organised by the Bengal Provincial Branch.

JALGAON BRANCH—The annual meeting of the branch was held on 21-9-52. Dr. K. N. Paradkar was in the chair. The report shows that 15 general meetings were held during the year. Scientific subjects and clinical cases were discussed in six meetings. The social activities of the branch were also commendable.

Office-bearers for 1952-53 were elected with Dr. K. S. Panat as president and Dr. D. R. Kulkarni as Secretary.

JEHANABAD BRANCH—An extraordinary meeting of the branch was held on 29-8-52. The secretary was congratulated for enrolling two new members. The Government was requested to devise means to check quackery, and arrangement for a baby show and exhibition of films on cleanliness at the time of the next annual conference was decided upon.

KANPUR BRANCH—The following films were exhibited on 23-8-52 by courtesy of the French Embassy, New Delhi. (1) Management of the Failing Heart; (2) Four Seasons in France; (3) Apicolyse Fasciale.

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A clinical meeting was held on 31-8-52 when Dr. R. N. Tandon, Head of the department of Tuberculosis, King George's Medical College, Lucknow, delivered a lecture to the members.

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A clinical meeting of the branch was held on 7-9-52 with Dr. N. Bhallay in the chair. Dr. S. P. Gupta, Professor of Ophthalmology, King George's Medical College, spoke on the "Role of modern Therapy in Ocular Diseases".

KARIMNAGAR BRANCH—A clinical meeting of the branch was held on 24-8-52 with Dr. N. R. V. Swami in the chair. There was a symposium on Anæmias. Dr. Gulam Murtaza spoke on the Pathology and Symptomatology of Anæmias. Drs. Bhoom Reddi and Md. Osman spoke on the treatment of Anæmias and Dr. N. R. V. Swami on the role of newer "Hæmatemic factors in Anæmias." Dr. K. Waheeduddin Ahmed demonstrated a case of Nephritis due to mercurial poisoning and another case of unresolved pneumonia.

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A meeting of the branch was held on 26-9-52, with Dr. N. R. V. Swami in the chair. Dr. K. Waheeduddin presented a case of T. B. Lung and Dr. Gulam Murtuza demonstrated a case of Amœbic Hepatitis. Dr. N. R. V. Swamy spoke on "Care of Mother and child".

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The annual meeting of the branch was held on 26-9-52 with Dr. N. R. V. Swami in the chair. The annual report shows that during the year, 12 clinical meetings were held in which varieties of subjects were discussed. Forty cases were presented for clinical demonstration in these meetings.

KOLHAPUR BRANCH—The annual report of the branch for 1951-52 shows all round activities. The branch had clinical meetings almost every month. Interesting papers were read and clinical cases were demonstrated. Interesting subjects like Medical Education, Rural Medical Aid, Medical Aid in Cities, Status of Private Medical Practitioner, the use of proprietory drugs and injections were also discussed.

KOLAR GOLD FIELDS BRANCH—A meeting of the branch was held on 24-9-52. Dr. A. S. Venkatachalam presided. Dr. K. Krishna Rao spoke on "Treatment of Chronic Suppurative Ottitis" with demonstrations. Office-bearers for the new year were elected with Dr. K. Krishna Rao as president and Dr. D. S. Sivappa as secretary.

KOTALPUR BRANCH—A general meeting of the branch was held on 23-8-52 with Dr. Mohini Mohan Ray in the chair. Ten members were present. The members expressed satisfaction at the inclusion of Dr. A. D. Mukherji and Dr. J. R. Dhar in the West Bengal Cabinet.

MADURA BRANCH—A combined clinical meeting of the branch and the Erskine Hospital Clinical Society was held on 30-8-52. Dr. M. N. Rajan was in the chair. Condolence resolutions on the death of Dr. M. G. Kini and Mr. M. A. Nayar were passed. The following cases were demonstrated: (1) Hydatid Cyst of Liver and Lung by Dr. F. Vadamalayan; (2) Hydatid Cyst-spleen (3) Ectopia Vesicul (4) Spina Bifida Occulta, by Dr. S. V. Joseph; (5) Solitary Cyst of the Kidneys (6) Nephrolithiasis by Dr. K. S. Krishnan (7) Genital Tuberculosis (8) a case of third Cranial Nerve Paralysis, by Dr. R. Venkatasami; (9) Osteoclastoma treated with X-ray Therapy by Dr. M. G. Varadarajan. The clinical session was conducted by Dr. Muhamed Ismail, the president of the Erskine Hospital Clinical Society.

MALABAR BRANCH—To meet Dr. M. V. Ramana Murthy, Deputy Director, Medical Services, Government of Madras, a special meeting of the branch was held on 18-9-52. Dr. C. K. Menon presided. Dr. Ramana Murthy in his speech stressed the importance on the patient-physician relationship and personal hygiene and environmental sanitation.

Dr. R. Nagan Gowda, Minister for Agriculture and Mr. K. P. Kuthi Krishnan were also present.

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A special meeting of the branch was held on 26-8-52. Dr. C. K. Menon presided. Fifty members were present. The meeting was addressed by Dr. U. Krishna Rao, Minister for Industries.

MALEGAON BRANCH—The annual meeting of the branch was held on 7-9-52 Twelve members were present. Office-bearers for 1952-53 were elected with Dr. G. G. Jahagirdar as president and Dr. G. S. Patnaik as secretary.

MANDYA BRANCH—The annual general meeting of the branch was held on 14-9-52 with Dr. K. Sundaresan in the chair. Twenty members were present. The members condoled the death of Dr. B. K. Ramakrishna Rao. Office-bearers for the year 1952-53 were elected with Dr. K. Sundaresan as president and Dr. B. Setu Rao as secretary.

MYSORE BRANCH—A clinical meeting of the branch (which was started on 20-1-52) was held on 24-2-52. Dr. S. V. Govinda Setty presided. Twenty-eight doctors were present. Dr. S. V. Govinda Setty spoke on "The Treatment of Enteric Fever with Chloromycetin".

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A meeting was held on 9-3-52 and the president and the joint secretary resigned.

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A general meeting was held on 30-3-52 and Dr. B. R. R. Reddy was elected the president of the branch. A case of Linitis Plastica was demonstrated by Dr. M. Audikeshawalu, two cases of Pericarditis and one case of gumma in the Brain Stem by Dr. S. V. Govinda Setty and Secondary deposits in the lungs and a fixed mass in left Supraclavicular region in a case of Ovarian Tumour by Dr. V. Ramachandra Naidu and one case of Sarcoma of the Scapular region by Dr. L. Audi Keshavalu. Forty-one members were present.

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A clinical meeting was held on 26-4-52. Dr. B. R. R. Reddy presided. Dr. S. Narayana Sethy spoke on the treatment of early exudative T. B. lesions with Streptomycin. The following cases were demonstrated: (1) successful pericardiectomy in a case of T. B. Pericarditis with adhesions by Dr. S. Narayana Sethy; (2) a case of cervical rib, with no symptoms, by Dr. B. R. R. Reddy; (3) Lung Abscess by Dr. B. K. Ramkrishna Rao; (4) 3 case of Alukaemic lymphatic Adenoma and a case of Traumatic Arteriovenous Aneurysin by Dr. S. V. Govinda Sethy; (5) a case of Tuberculosis of the skin by Dr. D. P. Jayaram

A clinical meeting was held on 31-5-52 with Dr. S. Narayana Sethy in the chair. The members condoled the death of Dr. B. K. Ram Krishna Rao. Dr. S. Narayana Sethy showed three skiagrams of the chest of a case of suspected foreign body in the bronchial tree and also serial skiagrams of the pelvis demonstrating Sacro-Iliac Joint Affections. Dr. S. V. Govinda Sethy demonstrated a case of Syphilic basal meningitis with unilateral headache and right facial nerve palsy, also a case of gumma of the brain stem. Dr. S. K. Visreshwar demonsrated the case of venereal infection with modes in both the tibirae and utnal, epitrochlear submaxillary and superior carvical lymph glands enlarged, mucous patches on the hard palate and rheumatic mitral and aortic regurgitation.

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A clinical meeting was held on 28-6-52. Dr. V. R. Naidu presided. Dr. S. Narayana Sethy demonstrated a skiagram chest of a case of acute atelectasis of the left lung, also skiagrams chest of a few cases of Tubercular Heart. He also showed an x-ray film of the chest of a case of Liver Abscess. Dr. V. Sangeeva Rao demonstrated a case of Pulmonary Tuberculosis with a giant cavity. A case of multiple mycloma was demonstrated by Dr. S. K. Visveshwar and a case of Broncho Oesophageal Fistula secondary to cancer oesophagus. Thirty-eight doctors were present.

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A clinical meeting was held on 26-7-52 with Dr. B. R. R. Reddy in the chair. Two cases of Poliomyelitis were demonstrated by S. K. Visveshwar and several skiagrams chest by Dr. S. Narayana Sethy.

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A Refresher course was arranged by the association for the members of the medical profession for 14 days from the 8th to the 21st November, 1952. Forty-five doctors attended the course.

POONA BRANCH—Dr. T. S. Tirumurti, the president of the I. M. A. paid a visit to Poona on 5-8-52. A very pleasant party was given to him by the members of the branch. The photograph shows Dr. Tirumurti with Dr. K. C. Gharpure, the president of the branch and some members.

PORBANDAR BRANCH—A clinical meeting of the branch was held on 24-8-52 with Dr. H. H. Chavda in the chair. Twenty members were present. Dr. Miss K. Nadkarni read case reports on "Vesicular Mole". Dr. H. A. Zavari narrated history of an interesting case for Diagnosis. Dr. B. D. Jhala read a case report on "Abscess Lung" and Dr. H. H. Chavda read a paper on domiciliary treatment of Tuberculosis.

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The annual meeting of the branch was held on 21-9-52. Twenty-three members were present. Office-bearers for the year 1952-53 were elected with Dr. H. H. Chavda as president and Dr. B. D. Jhala as secretary. Dr. M. M. Nanawati read a paper on "Ketosis and Acidœmia". Dr. R. D. Dave read a paper on "Glaucoma", and Dr. J. P. Sthanki, a case report on "Emyema".

SHIMOGA BRANCH—The 2nd annual conference of the branch was held on 7-9-52. Dr. B. N. Rajagopal was the chairman of the Reception Committee, Sri S. Muninanjappa inaugurated the conference and Dr. B. N. Rangappa presided over it. The scientific section was presided over by Dr. M. Sivaram. Dr. B. N. Rajagopal was elected the president and Dr. T. Prasanna Sinha the secretary of the branch for the next year. In the scientific session, the following papers were read (1) Industrial Health by Dr. C. Gopalaraj Chetty; (2) Industrial Dermatitis by Dr. D. P. Jayaram; (3) Industrial Accidents by Dr. Dhananjaya; (4) Pneumonia in Shimoga Town by Dr. D. Krishnamurthy; (5) Analysis of cases of Whooping Cough by Dr. B. R. Shama Rao; (6) Case reports on (a) Trachycardia and (b) Aerophagy; (7) ACTH by Dr. K. S. Shadaksharappa and (8) Low Back Pain by Dr. T. N. Srinivasia.

SOUTH INDIAN PROVINCIAL BRANCH—A meeting of the Council of the South Indian Provincial Branch was held on 26-7-52. Seventeen members were present. Condolence resolutions on the death of U. Rama Rao of Madras, Dr. K. Govinda Iyer of Valliyur, Dr. G. S. Katre of Madras were passed. The minutes of the previous council meeting were adopted. Regarding a permanent office for the Provincial Branch, the secretary was requested to circulate the proposals of the sub-committee to all branches for opinion. The 3rd quarterly statement of accounts was approved subject to final audit.

The annual report of the branch for 1951-52 shows that it was an eventful year. The present strength of this Provincial branch comprising of 19 constituent branches is 1,489. It shows an increase of 154 members. Many of the branches held clinical meetings regularly during the year. There were 4 Provincial council meetings, when apart from transacting routine association business, several important resolutions bearing on famine relief, medical education, etc., were considered and adopted.

SURI BRANCH—Members of the branch and other local doctors met Dr. A. D. Mukharji, Deputy Minister, Medical and Public Health, on 13-9-52 at a tea-party. The Deputy Minister discussed with the members, the various medical problems which the medical men have or will have to face.

THE TIRUNELVELI DISTRICT MEDICAL ASSOCIATION—A meeting of the General Body of the Tirunelveli

branch was held at Palayamkottai on 5-8-52. Dr. K. Rama Ayyar, the president was in the chair. Sixty members were present. It was resolved that the seventh South Indian Provincial Medical Conference be invited to Palayamkottai on the 20th, 21st and 22nd September, 1952.

TANJORE BRANCH—A meeting of the branch was held on 31-8-52 with Dr. N. R. Subramanian in the chair. Thirty-eight doctors were present. Dr. V. S. Annaswamy of Shiyali spoke on some aspects of Hypertension.

TIRUCHY BRANCH—A meeting of the branch was held on 3-9-52. Dr. R. Kalamegham was in the chair. Fifty members were present. A condolence resolution was passed on the death of Dr. M. G. Kini. Dr. B. Ramamurthy gave a talk on Spinal Chord Lesions. A lively discussion followed the lecture.

UTTAR PRADESH BRANCH—The fourth meeting of the working committee of the branch council was held on 31-8-52. Dr. B. Thungamma presided. Thirteen members were present. A condolence resolution on the death of Dr. Bhupal Singh, a past president of I.M.A. was passed. The members also condoled the death of (1) Dr. Amba Prasad Saxena (2) Dr. S. P. Srivastava (3) Dr. Shobha Ram (4) Dr. A. P. Varma. It was decided to hold the XVII U.P. medical conference at Sitapur on October 25th and 26th, 1952. The programme was approved. Dr. P. L. Sood of Lucknow were declared to be elected as president of the branch for 1952-53. A sub-committee was formed for framing resolutions for the next conference. A publicity committee was also formed. A committee was formed for selecting candidates for internships and residences in U.S.A. for 1953. The secretary was requested to prepare the final draft of the suggested amendments to the Rules of the Indian Medical Association.

29TH ALL-INDIA MEDICAL CONFERENCE, PATNA

To be held on 26th, 27th & 28th December, 1952

IMPORTANT INFORMATION FOR DELEGATES AND VISITORS TO THE CONFERENCE

Reception—There will be reception office at the Patna Junction Rly. Station just opposite the First and Second Class booking office. There will also be a reception office at Mahendru Ghat for persons coming by North-Eastern Railway (old O. T. Rly.) and at the aerodrome for persons travelling by air to Patna.

Transport—Volunteers will be available at these reception office who will give necessary information and arrange transport.

Lodging and boarding—Arrangements for lodging and boarding will be made if previous intimation is received by the General Secretary, Reception Committee, from delegates and visitors not later than 15th November, 1952. They are also requested to intimate whether they will take vegetarian or non-vegetarian food. Tea, breakfast, lunch and dinner will be served to delegates and visitors on tickets to be had at the camp on arrival. The approximate cost will be Rs. 10/- per head per day.

Railway concessions—Delegates and visitors wishing to attend the conference should apply for necessary certificate to the General Secretary, on the production of which at the nearest D. T. S. Office, single fair double journey concession authority slip for any class will be obtained. Production of this authority to the railway booking office will enable them to issue the concession tickets.

Branch secretaries are requested to send the list of delegates and visitors immediately. Further information may be obtained from General Secretary, Reception Committee, 29th All-India Medical Conference, Patna.

SCIENTIFIC SECTION

A scientific section will be organised with sessions in the morning and evening. Three topical subjects have been selected for symposia, *viz.*, (1) Place of Antibiotics and Chemotherapeutic Drugs in the treatment of Tuberculosis Infection (2) Management of heart failure and its complications (3) Bowel disorders. Paper on various other subjects will also be presented.

It has been proposed to organise the scientific exhibit section in groups, representing the different branches of medical science, *e.g.*, Medicine, its different specialities and Pharmacology; Surgery, its different specialities and Anæsthesiology; Obstetrics and Gynæcology; Ophthalmology and Oto-rhino-laryngology; Preventive, Social, Industrial Medicine, Public Health, Nutrition and Forensic Medicine; Radiology, Anatomy and Physiology. The Exhibits are to be presented in the form of Models, Charts, Diagrams, Specimens, etc. Synopsis of exhibits should be sent by the 10th November, 1952, to finalise the arrangement.

The Reception Committee earnestly appeals to the members to contribute useful papers, demonstrate interesting cases on the occasion and to take part in discussions.

To enable the Committee to bring out a comprehensive list, typed copies of synopses of papers, nature and number of cases to be demonstrated and a list of exhibits should reach the undersigned by the 10th November, 1952.

PROVISIONAL PROGRAMME OF THE CONFERENCE

I. M. A. Working Committee meeting	...	21st & 22nd Dec., 1952
I. M. A. Central Council meeting	...	23rd, 24th & 25th Dec., 1952
Open Conference	...	26th, 27th & 28th Dec., 1952

P. N. SINHA,
Hony. General Secretary,
29th A.-I. N. Conference.

Bari Road,
Patna.

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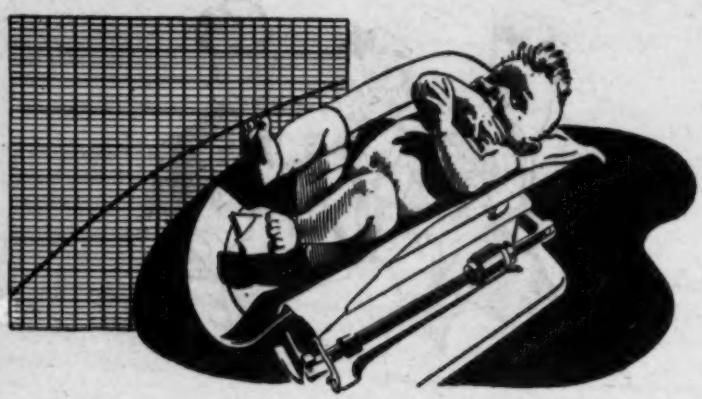

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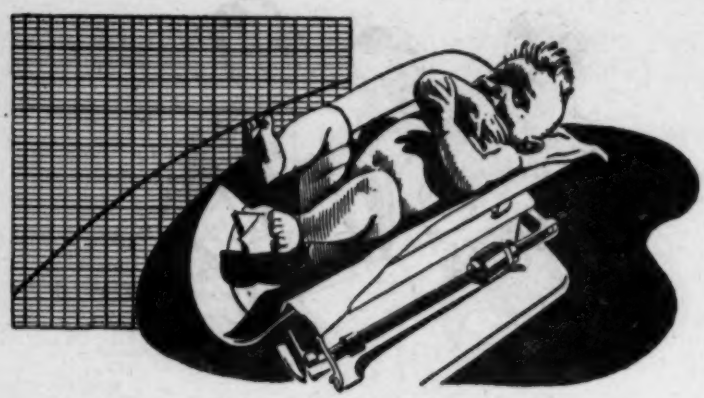

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★ "There was no aggravation of the condition or delay in healing following the use of tampons in the patients who had cervical erosions."

★ "In each case the underlying cause responded to treatment, and did not recur, which proves that the internal tampon does not act as an irritating foreign body."

★ "The rate of healing compared favourably with four control cases in which the perineal pad was used."

★ "The glycogen content was uninfluenced by the use of tampons."

★ "There was no appreciable alteration in the pH in the pre- and post-menstrual phases."

★ "Volunteers who had not previously used tampons stated that they did not cause the irritation usually found with the perineal pad."

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British Medical Journal, I, 84 (1952)

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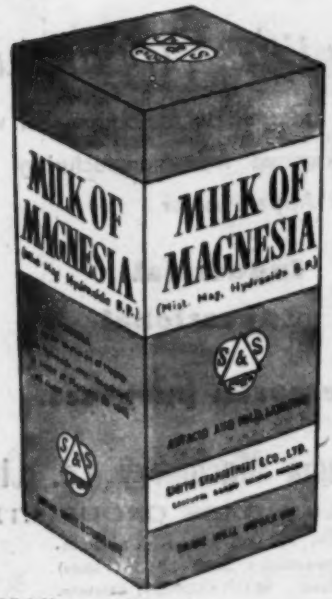

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[1] Britton C. J. C. (1950): Practitioner, 164, 458

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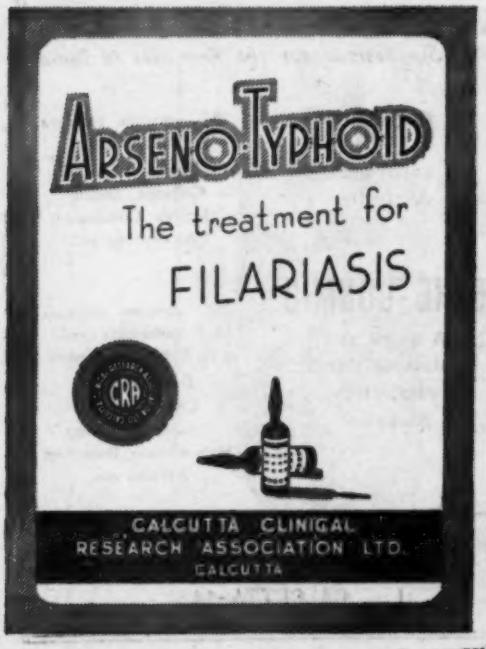

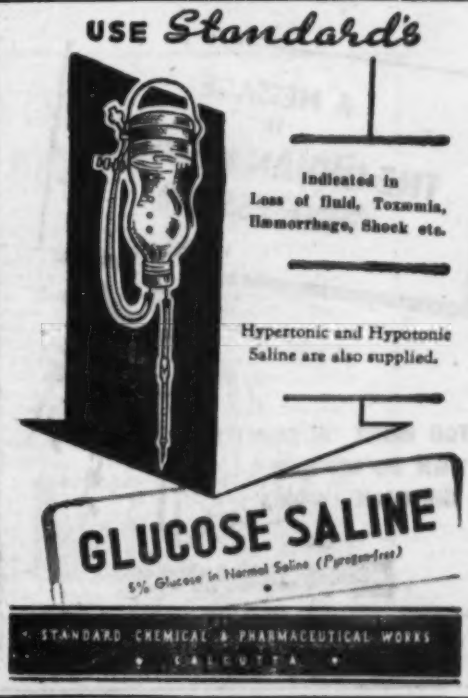

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